Measuring the Implementation and Effects of a Coordinated Care Model Featuring Diabetes Self-Management Education within Four Patient-Centered Medical Homes

By

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Abstract

Minority individuals experience a disproportionately greater incidence and prevalence of type 2 diabetes. Innovative approaches are needed to reduce health disparities and associated harms among vulnerable populations with diabetes. This thesis examines the effects of the implementation of a coordinated care model with underserved populations in Patient Centered Medical Homes (PCMH) at four sites (Florida, Ohio, Oklahoma, and Tennessee). The model featured diabetes self-management education (DSME) and a patient support intervention delivered within the PCMH context. The components of the comprehensive intervention included DSME, support for managing diabetes and distress, enhanced access and linkage to care, and improvement to quality of care. The primary dependent measures in this study included four clinical health measures—glycosylated hemoglobin (A1C), blood pressure, body mass index, and lipids—and the AADE7 Self-Care Behaviors™. Coordinated care teams that delivered the intervention included primary care physicians, nurse care coordinators, certified diabetes educators, health behavior coaches, and diabetes patient supporters. Community health workers and medical assistants provided additional individualized support to patients. Care teams provided DSME as well as customized and coordinated patient support within a PCMH setting. This study was part of a larger participatory evaluation of the Bristol-Myers Squibb Foundation's Together on Diabetes initiative. A statistically significant decrease was seen in A1C, the primary clinical health outcome. This decrease was seen across all four implementation sites; ranging from a decrease of 0.4% to 0.9% after 6 months. This improved A1C level was associated with implementation of the DSME and support intervention. Substantial policy and practice changes were also brought about at two of the four PCMH sites. Use of DSME within the PCMH model is a promising strategy for reducing clinical markers for diabetes among vulnerable populations.

Systems changes, including policy and practice changes, have the potential to have lasting effects within PCMH practice for reducing the burden of diabetes.

Keywords: Diabetes Self-Management Education, Patient-Centered Medical Home, coordinated care

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Diabetes mellitus is a devastating chronic disease of national importance. The harmful effects of the disease experienced by patients include both health- and economic-related outcomes. Nearly 26 million Americans live with diabetes (Centers for Disease Control & Prevention, 2011). Further, an estimated 79 million adults are prediabetic with as many as 9–50% developing overt diabetes during their lifetime (Zhang et al., 2010). In the United States, diabetes is the leading cause of kidney failure, nontraumatic lower-limb amputations, and new cases of blindness. It is also the seventh leading cause of death (Centers for Disease Control & Prevention, 2011). A total of 246,000 premature deaths occur in the US annually as a result of diabetes and diabetes sequelae (Yang et al., 2013); many of which can be prevented through managed care (Diabetes Prevention Program Research Group, 2009). Moreover, incidence and prevalence of this disease is increasing at a dramatic rate. Evidence suggests that diabetes prevalence will increase from 8.3% to a rate that will include 25–28% of the US population by the year 2050 (Boyle, Thompson, Gregg, Barker, & Williamson, 2010).

Further, the financial burden of diabetes includes substantial direct (e.g., medical billing, testing supplies) and indirect (e.g., missed productivity) costs to patients. In 2012, the estimated cost to diabetes patients totaled $245 billion; this included $176 billion in direct medical costs and $69 billion in indirect costs associated with lost productivity (Yang et al., 2013). This represents a 41% increase in total cost to patients within just 5 years, up from the 2007 estimate of $174 billion (Yang et al., 2013). By this estimate, the average diabetes patient spends approximately $7,892 per year on direct medical expenditures—the largest share from hospitalizations (Yang et al., 2013). On average, diabetes patients incur average medical expenditures at a rate 2.3 times greater than those without the disease (American Diabetes Association, 2013). Minorities and low-income patients are disproportionately affected by the

disease experiencing the greatest financial burden and health disparities (Chow, Foster, Gonzalez, & McIver, 2012).

Racial/ethnic minority and low-income populations are disparately impacted by diabetes. The prevalence of diabetes among minorities is considerably higher than non-Hispanic whites and they are at higher risk for developing the disease, especially among African Americans (Chow et al., 2012). Diabetes affects African Americans at a prevalence 2.6 times greater than non-Hispanic whites (18.7% compared to 7.1%, respectively) and are 77% more likely to develop the disease. Additionally, evidence has shown that patients experiencing income inequality are more likely to develop diabetes than high-income earners, but are least likely to utilize healthcare resources (Bachmann et al., 2003; Rabi et al., 2006). In short, those patients with the greatest need for diabetes care are the least likely to receive it. Inability to access health insurance compounds this problem. Racial/ethnic minorities and those experiencing poverty also represent a disproportionate number of uninsured or underinsured Americans (U.S. Department of Health and Human Services, 2014a), a fact that makes accessing needed care for managing diabetes challenging.

Resource utilization incurred on the healthcare system by those with diabetes is substantial. Those with diabetes consume 29.3% (250.8 of 856.8 million units) of all institutional care (i.e., hospital inpatient days, nursing/residential facility days); 54.8% (269.2 of 491.5 million units) of all outpatient care visits (i.e., physician office visits, emergency department visits, hospital outpatient visits, home health visits); and 22.1% (673.1 of 3,051.1 million units) of all medical prescriptions in the U.S. (Yang et al., 2013). Further, diabetes patients account for 33% (28.2 of 85.7 million units) of all primary care visits and for 39% (3.0 of 7.8 million units) of all hospital outpatient visits in the U.S. (Yang et al., 2013). If diabetes prevalence more than

triples by 2050 as some have predicted (Boyle et al., 2010), the capacity of the healthcare system will be exceeded at this rate. Strategies that address diabetes in the future will need to improve the efficiency of healthcare utilization and help increase the capacity of the healthcare system as a whole.

The challenge of increasing the healthcare system's capacity for providing diabetes care, combined with the severity and magnitude of diabetes has drawn heightened, national attention to the disease. Strategic planning and legislation efforts have focused on reducing the severity and harm of the disease through prevention efforts. Improving diabetes health outcomes, quality of life, and reducing the financial impact of treatment to patients are top priority objectives of Healthy People 2020 (US Department of Health Human Services, 2000)—the strategic framework for improving the nation's health. Moreover, only a small portion of those diagnosed with diabetes, about 7%, are at recommended clinical values for glycosylated hemoglobin (A1C), blood pressure, and low-density lipoprotein (LDL) cholesterol (Saydah, Fradkin, & Cowie, 2004). Additionally, the implementation of the Affordable Care Act sought to bring evidence-based strategies for enhanced diabetes prevention (U.S. Department of Health and Human Services, 2014b), as well as benefits provisioned by the law that included increased insurance coverage/access to primary care, reduced healthcare costs, improved coordinated care, and reduced health disparities (Koh & Sebelius, 2010). With this, innovative approaches to ensure the availability of diabetes care through enhanced access and the promotion of the national agenda for increasing the capacity of the healthcare system are needed.

The Patient-Centered Medical Home (PCMH) is one model proposed in an effort to improve chronic care for diabetes patients. The PCMH offers a common set of components for delivering primary care: a) care coordination, b) quality and safety, c) whole person orientation,

d) personal physician, e) physician leadership, and f) enhanced access and payment (Patient-Centered Primary Care Collaborative, 2007). Taken together, the PCMH may be an effective framework for delivering the Chronic Care Model (Bojadzievski & Gabbay, 2011)—an evidence-based guide for improving primary care for treating chronic disease with complex illness trajectories like diabetes (Nutting et al., 2007). Results from pilot demonstrations across 1,400 practice clinics that delivered diabetes care through the PCMH model showed improvements in patient health outcomes (e.g., HbA1c, blood pressure, LDL cholesterol), population health indicators (e.g., hospitalization use, inpatient admissions, pharmacy utilization), and return on investment (Bojadzievski & Gabbay, 2011). Further, the delivery of patient support through community health workers (CHW) has improved A1C among patients as a part of a coordinated care approach among community clinics (Collinsworth, Vulimiri, Schmidt, & Snead, 2013). For these patients, CHWs extended the delivery of diabetes care beyond the primary care clinic and may be particularly effective for addressing health inequality experienced by vulnerable, minority populations.

Diabetes self-management education (DSME) has also been effective for improving A1C and becomes more effective with increased time of contact with diabetes patients (Norris, Engelgau, & Narayan, 2001; Norris, Lau, Smith, Schmid, & Engelgau, 2002). Patient DSME is defined as the ongoing process of facilitating the knowledge, skill, and ability necessary for prediabetes and diabetes care (Haas et al., 2013). Often delivered by certified diabetes educators, DSME has been effective when administered by those without certified credentials (e.g., CHWs) while supervised by certified diabetes educators (citation needed). Improving patient access to DSME is necessary to fully address the disease, however, access to certified diabetes educators may prove challenging as the prevalence of diabetes increases (Boyle et al., 2010) and their use

within coordinated care becomes more widespread (Martin & Lipman, 2013). Adopting a leveled or tiered approach to diabetes education may be necessary to meet the demand of diabetes education in treatment settings. For example, the Level 1 provider level includes non-health care professionals (e.g., CHWs, health promoters), while Level 5 providers (e.g., diabetes educators, clinical managers) offer advanced-level care or serve as consultants (Martin & Lipman, 2013).

Despite their effectiveness, neither implementation of the Chronic Care Model or the PCMH systematically integrate DSME or into their diabetes care protocols. The American Association of Diabetes Educators (AADE)—with grant funding from the Bristol-Myers Foundation—sought to test the feasibility of such an approach. Within a multisite intervention, AADE and their selected partners implemented an accredited DSME program within four PCMHs using a leveled diabetes educator methodology. Specifically, this intervention sought to test the feasibility of using Level 1 (e.g., CHWs) and Level 2 (e.g., medical assistants) diabetes educators within the PCMH setting.

The AADE initiative featured an *active process*—as described within the implementation science literature—of intervention implementation (Fixsen, Blase, Naoom, & Wallace, 2009). Through this approach, AADE acted as outside experts to assure the fidelity of the implementation of best practices within each of the PCMH practices. Evidence suggests that this form of implementation may yield higher fidelity and, in turn, greater effect than more passive forms of practice change, such as practitioner adoption of diffused or disseminated best practices which is more common (Fixsen et al., 2009). The current evaluation research examined the implementation, effectiveness, and sustainability of the AADE coordinated diabetes care intervention.

Method

Context

The American Association of Diabetes Educators (AADE), the nation's professional association for diabetes educators, sought to improve quality and expand access of health care for treating underserved patients, especially African American and Latinos, with diabetes through coordinated care. This coordinated care approach featured the integration of two overarching components: the patient-centered medical home (PCMH) and diabetes self-management education (DSME) that used community health workers for the delivery of community-based diabetes behavior management. Both PCMH and DSME share common principles, including a focus on personalized care that actively involves the patient (National Diabeting Education Program, 2009; Patient-Centered Primary Care Collaborative, 2007). Thus, the project sought to integrate multi-level DSME teams that included community health workers within PCMHs into a coordinated model for diabetes care.

The aims of the AADE intervention were to implement and test the feasibility of a coordinated care diabetes intervention that featured DSME as a core component. The intervention featured a physician-led, coordinated team approach to develop an effective model for patient-centered diabetes care for patients in disproportionately affected communities. By integrating DSME within the PCMH model, AADE sought to expand access to care to improve self-care behaviors, clinical outcomes, and program satisfaction for patients with diabetes. Lessons learned from this approach would inform the development of future interventions seeking to integrate comprehensive diabetes education services, including challenges related to the identification of appropriate clinical care settings, the delivery of DSME, and the training of lay health workers (e.g., community health workers, medical assistants, AmeriCorps volunteers)

within the PCMH context. Another goal of the project was to develop a self-sustaining and scalable diabetes education model that could be generalized to other communities experiencing health disparity.

The current study was conducted as part of the overall participatory evaluation of the Bristol-Myers Squibb (BMS) Foundation's Together on Diabetes (ToD) initiative conducted by the University of Kansas Work Group for Community Health and Development (KU Work Group). The AADE demonstration project was one of 25 separate initiatives funded by the ToD initiative to address type 2 diabetes among populations experiencing health disparities. The overall aim of the participatory evaluation is to help understand and improve the impact of projects within the ToD initiative.

Using an online monitoring and evaluation system, a common set of goals and evaluation questions were used for meaning-making across all of the various ToD grantee initiatives, including the AADE intervention featured in the current study (see Appendix A). This monitoring and evaluation system used a common framework to measure indicators and outcomes for continuous improvement through systematic, participatory reflection. Similarly, a common logic model, created collaboratively with KU Work Group, ToD, and AADE staff, served as a common framework for guiding the participatory evaluation (see Appendix B).

Implementation Settings

To help understand the generalizability of this integrated model, AADE identified and selected four different implementation partners; each providing care to a different underserved patient population disproportionately affected by diabetes. To identify and select quality implementation partners to serve the needs of disparity populations in their local area within the context of the PCMH model, AADE contacted several relevant stakeholders in the field (i.e.,

American Osteopathic Association, National Minority Quality Forum, and the AADE Research Committee). The diverse settings for diabetes care within the selected sites included community health centers with unbounded participation (e.g., Jacksonville Urban Disparity Institute) as well as university settings using experimental designs with prescribed sample sizes (e.g., Vanderbilt Diabetes Research and Training Center). Each of the four sites had to meet three eligibility criteria for participation: 1) Have, or willing to obtain an accredited DSME program through a National Accreditation Organization (e.g., AADE, ADA); 2) Have or agree to fulfill the National Committee for Quality Assurance Requirements for recognition as a PCMH; and 3) Provide services to an underserved population disproportionately affected by diabetes (e.g., low-income residents of the Ohio Appalachian region). The four sites selected to implement the integrated model were: a) The Jacksonville Urban Disparity Institute (JUDI) in Jacksonville, Florida; b) The Diabetes Institute at Ohio University (DIOU) in Athens County, Ohio; c) The Harold Hamm Diabetes Center (HHDC) in Oklahoma City, Oklahoma; and d) The Vanderbilt Diabetes Research and Training Center (DRTC) in Nashville, Tennessee. Of the four primary care sites selected for intervention, one was an established PCMH at the time of selection (JUDI); and three had an accredited DSME program within their diabetes care practice (JUDI; HHDC; and DRTC), see Table 1. At the time of program implementation, all four sites reported receiving PCMH status and had established an accredited DSME program.

Table 1

PCMH and DSME Status at the Point of Site Selection and Patient Demographics

Sites	Established PCMH	Accredited DSME	Primary Patient Ethnicity		Age Range of Patients
Jacksonville Urban Disparities Institute (JUDI)	Yes	Yes	African American Caucasian Hispanic/Latino Other	82% 12% 3% 3%	M_{years} = 57.9 (19–86 years) *n* = 83
Diabetes Institute at Ohio University (DIOU)	No	No	Caucasian African American	96% 4%	M_{years} = 61.3 (41–78 years) *n* = 20
Harold Hamm Diabetes Center (HHDC)	No	Yes	African American	100%	M_{years} = 57.0 (28–79 years) *n* = 42
Vanderbilt Diabetes Research and Training Center (DRTC)	No	Yes	Caucasian African American Other	53% 37% 10%	M_{years} = 60.1 (35–85 years) *n* = 28

Additionally, implementation of the coordinated care model fell into two broad categories. While all four of the PCMH implementation sites tested the feasibility of integrating DSME within the PCMH practice, two sites (DIOU and DRTC) had the additional aim of testing the fidelity of the coordinated care model. Within these sites, the intervention consisted primarily of DSME sessions with enrolled diabetes patient participants. This fidelity-level implementation sought to produce a relatively modest number of services, consistent with the prescribed model, with the goal of informing replication and scaling. In contrast, the remaining sites (JUDI and HHDC) integrated the coordinated care approach as a change within their already existing care practices in addition to testing its feasibility. This practice-level implementation was not restricted exclusively DSME, but included additional activities to support and enhance access to

underserved patients and residents experiencing diabetes (e.g., diabetes education outreach efforts with seniors, diabetes support group).

Site 1: The Jacksonville Urban Disparity Institute JUDI. The Jacksonville Urban Disparity Institute is affiliated with the University of Florida Health Science Center and the Shands Jacksonville Medical Center. It is part of a PCMH network comprised of nine clinics located throughout Jacksonville, Florida that have adopted the Chronic Care Model for delivering diabetes care. Founded in 2008, JUDI clinics serve both insured and uninsured patients, as well as those best served through designated provider services (i.e., uninsured, Medicaid, and indigent patients). Overall, the goals of JUDI are to remove barriers to care, decrease emergency room visits, and improve the overall health of its patients. Approximately 18,000 patients are treated annually by JUDI clinics. At the time of the study, 2,529 of those patients were known to be experiencing diabetes.

JUDI's capacity for comprehensively addressing diabetes began in 2006 with implementation of the ADA-accredited Diabetes Rapid Access Program (D-RAP). Developed by the Shands Medical Center, this was later adopted by JUDI. The D-RAP, tailored to work within the PCMH model, focuses on the needs of patients with prediabetes as well as those with uncontrolled diabetes. At the time of site selection, JUDI had an accredited DSME program. A total of 83 JUDI patients were included in the present study (see Table 1). Jacksonville is located in Duval county, where more than 74,000 residents (11.5%) have been diagnosed with diabetes (Centers for Disease Control and Prevention, 2013b).

Site 2: The Diabetes Institute at Ohio University (DIOU). The Diabetes Institute at Ohio University—in partnership with their clinical care team, University Medical Associates and Live Healthy Appalachia—was selected by AADE to deliver the integrated diabetes model to

low-income Appalachian patients within Athens County, Ohio. Athens County residents experience diabetes at a rate higher (10.4%) than the national average (Centers for Disease Control and Prevention, 2012). To meet the AADE eligibility requirements, DIOU achieved PCMH status and adopted an accredited DSME program. A total of 20 patients participated in the present study (see Table 1).

Site 3: Harold Hamm Diabetes Center (HHDC). The Harold Hamm Diabetes Center, a University of Oklahoma practice clinic in partnership with the School of Pharmacy, is focused on innovative strategies for diabetes treatment, education, and prevention. Serving Oklahoma City, Oklahoma, the HHDC offers access to endocrinology specialists, diabetes education and lifestyle management, podiatry, behavioral health, exercise education, support groups, and outreach services.

Oklahoma residents experience diabetes at a rate higher than the national average; and Oklahoma ranks among the 10 worst states for diabetes prevalence (Centers for Disease Control & Prevention, 2012). At the time of site selection, the HHDC already had an accredited DSME program and was an accredited PCMH; thus meeting AADE's participation criteria. Overall, the HHDC serves more than 2,000 people with diabetes. For this project, HHDC staff recruited 42 patients, all of whom were African American (see Table 1).

Site 4: Vanderbilt Diabetes Research and Training Center (DRTC). The Vanderbilt Diabetes Research and Training Center is a comprehensive diabetes care provider with six locations in Nashville, Tennessee. Treating thousands of diabetes patients each year, the Vanderbilt DRTC uses a coordinated team approach to provide personalized care. Patients have full access to specialist services including endocrine, gestational, and foot care.

Adult Tennessee residents experience diabetes at a rate higher than the national average; Tennessee is ranked with the sixth highest rate for the disease nationally. At the time of site selection, the Vanderbilt DRTC already had an accredited DSME program and was an accredited PCMH, thus meeting the established inclusion criteria. This site engaged 28 diabetes patients in the study (see Table 1).

Research questions

The aim of the present research was to examine the implementation, associated outcomes, and sustainability tactics used in the delivery of the DSME-PCMH coordinated care concept. To this end, this report examines three specific research questions:

1) How were the elements of the coordinated care model implemented across a multi-site diabetes self-management and support initiative?
2) Was implementation of the coordinated care model associated with improvement of clinical health indicators for diabetes and behavioral indicators for diabetes self-management?
3) How were the elements of the coordinated care model of the diabetes initiative sustained beyond the initial grant funding?

Research Design

This study used an empirical case study design to examine these questions. This design was best suited for this study for several reasons. The primarily purpose of the current study was to investigate how the interventions naturally unfolded at each site (Yin, 2009). Three of the four sites implemented interventions that affected all diabetes patients, which made finding control comparisons difficult. Investigators also had little control over the implementation of interventions or the context in which they were implemented (Yin, 2009). A within-subject experimental design was used to evaluate effects on clinical and patient self-management behavior indicators.

Measurement

Measurement of implementation. To capture implementation of the coordinated care model, the researcher (a staff member of the KU Work Group) used an online documentation and support system (ODSS) to measure the activities taken to implement the intervention (Fawcett & Schultz, 2008). This system enabled the recording of the discrete activities of each site participating in the AADE demonstration project. The ODSS allowed for the creation of graphic data displays from the accomplishments entered into the database that would later be used for collaborative sensemaking between KU Work Group and AADE staff. Measurement of implemented activities consisted of the: a) capture of activities (e.g., "The staff at Harold Hamm Diabetes Center at the University of Oklahoma provided a training session on foot exams for their Diabetes Self-Management Education program for their enrolled patients with diabetes."); b) coding of the qualitative, captured activities (e.g., instances of services provided); c) characterization (e.g., Behavior change strategy of providing information/enhancing skills); and

d) communication of discrete activities as data displays (e.g., graphs of number of sessions of services provided over time).

Documented activities were coded into seven distinct categories: a) development activities related to the project (e.g., hiring community health workers); b) community advocacy (e.g., creation of new partnerships to bring about a specific community or systems change); c) community and systems changes (i.e., new or modified policies, programs, and practices); d) services provided (e.g., instances of diabetes self-management education); e) resources generated or leveraged time or money (e.g., the use of AmeriCorps workers as CHWs); f) dissemination efforts as a result of the project (e.g., scientific publications); and g) other. Specific codes and their definitions from a codebook are noted briefly here (see Appendix C):

- *Development Activity*—Actions taken to prepare or enable the group to address its goals and objectives (e.g., training of community health workers to engage patients experiencing diabetes).
- *Community Advocacy*—Action taken to bring about a specific new or modified program, policy, or practice in the community or system (e.g., partnering with a local wellness committee to provide program referrals to patients with diabetes).
- *Community/System Change*—A new or modified program, policy, or practice in the community, system, or organization (e.g., implementing a new or modified DSME curriculum).
- *Services Provided*—Delivery of information, training, or other valued goods or activities (e.g., delivery of an ongoing patient-support group).

- *Resources Generated*—Acquisition of resources for the initiative through grants, donations, or gifts in kind (e.g., the use of AmeriCorps volunteers in the delivery of enhanced patient support).
- *Dissemination Effort*—Conveying information about the initiative and its accomplishments to audiences outside the community to be served (e.g., published scientific papers and presentations).
- *Other*—Items for which no code or definitions have been created (e.g., a health fair occurring within the community in which those in the initiative did not participate).

The author used written definitions and instructions for coding activities (e.g., as Services provided, community/systems change) and for their characterization (e.g., by goal area, intervention component).

Key informant interviews with project staff. Implementation data were captured using both key informant interviews and document review (e.g., written reports). Key informant interviews, a form of semi-structured interview, were conducted with project directors for each of the four implementation sites using an established protocol (see Appendix D). These qualitative data were used to systematically capture, code, and characterize activities associated with planning and implementing the intervention; and these data were stored in the ODSS system.

The researcher conducted key informant interviews with project staff over a 2-week period in May, 2013, each lasting 90 minutes via telephone. First, AADE staff identified project directors at each PCMH site. In the week prior to the call, key informants received a primer questionnaire from AADE staff to help prompt the recall of specific activities related to the

development, implementation, or communication of the project. Seven questions were asked about community/system changes, services provided, advocacy efforts, project development activities, dissemination efforts, and resources generated (e.g., "What services were implemented within or by the organization to promote the goals of the Together on Diabetes project?"; see Appendix E). Next, the author (a KU Work Group staff member) conducted the key informant interview via telephone (see Appendix E). Through email, site leads (key informants) identified a number of specific programs, policies, practices, and service activities that promoted the goals of the program. Key informants then provided further detail during the interviews that described each activity identified (i.e., who, did what, when, with whom, and toward what goal), which permitted coding by type of activity (e.g., community/systems change, services provided). It also enabled activity characterization (e.g., type of strategy used; goals addressed) of coded activities. In turn, this allowed for categorization (e.g., "Which type of behavior change strategies were addressed by this activity?).

Document review. Additional project implementation data were gathered from documents provided by site staff. The author reviewed and identified activities from project proposals, progress reports submitted to the foundation, healthcare practice protocols, scientific presentations, and publically available websites. Identified activities were captured, coded, and characterized within the ODSS monitoring and evaluation system.

Interobserver agreement on coding of implementation activities. The author served as the primary documenter, capturing and coding all 151 documented entries. Another researcher from the KU Work Group independently coded 45 (29.8%) of the entries. The author calculated trial-by-trial interobserver agreement between the primary and secondary documenters by dividing the number of entries coded the same by both (44) by the total number of entries both

documenters observed (45). The resulting interobserver agreement was 97.8%. The Cohen's κ statistic for interobserver reliability was .90.

Measurement of clinical and behavioral indicators. Each implementation site recorded a shared set of clinical measures for evaluating the severity of diabetes among patients. These indicators included glycosylated hemoglobin (A1C), body mass index (BMI), systolic (SBP) and diastolic blood pressure (DBP), and lipids (i.e., high-density lipoprotein cholesterol [HDL-C], low-density lipoprotein cholesterol [LDL-C], cholesterol total [CT], and cholesterol triglyceride [CITG]). The study's patient enrollment was conducted on a rolling basis. Clinical values and the AADE7 Self-Care Behaviors™ instrument, a measure used to assess changes in patient diabetes self-management behavior, were recorded by clinical laboratory staff at baseline, 3 months, and 6 months, relative to the time of patient enrollment between September, 2011 to July, 2012. The following protocols were used by PCMH staff to record these indicators:

- A1C—Glycosylated hemoglobin was measured according to Centers for Disease Control and Prevention's (CDC) Division of Laboratory Sciences diabetes measurement standardization program (Centers for Disease Control & Prevention, 2013a).
- BMI—Body Mass Index was calculated by measuring patient weight in kilograms using a validated floor scale and dividing by their height, squared, measured using a stadiometer, a device used for measuring patient height (Deurenberg, Weststrate, & Seidell, 1991).
- Blood Pressure—Blood pressure was measured using the auscultatory (listening) method and a mercury sphygmomanometer, an instrument for measuring blood pressure, as described in Pickering et al. (2005).

- Lipids (i.e., HDL-C, CT, & CITG)—Lipids were measured in accordance with the Centers for Disease Control and Prevention's (CDC) Lipid Standardization Program, accuracy-based guidelines (Centers for Disease Control & Prevention, 2014)
- AADE7 Self-Care Behaviors™—The self-care behaviors instrument developed by AADE assessed patient proficiency among seven health behaviors intended to be improved as a result of the implementation of the DSME curricula. These self-reported behaviors included healthy eating, being active, monitoring, taking medication, problem solving, reducing risks, and healthy coping (Boren, 2007).

Assessment of strategies for sustainability. As mentioned above, the implementation sites included in this study consisted of two types—university-based research settings (i.e., DRTC) and practice-based projects that focused primarily on targeted community and systems changes to improve conditions affecting their client's diabetes self-management (i.e., JUDI, DIOU, HHDC). Practice-based projects attempted to sustain policy and practice changes that would enable maintenance of effects beyond the initial funding period. This strategy assessment focused on specific elements of the intervention that were (or were not) sustained. Data for sustainability tactics were gathered using reports to the foundation and documented activities, and key informant interviews conducted with AADE and site staff. Specifically, 12 tactics for sustainability (e.g., solicit in-kind support; Community Tool Box, 2014; Paine-Andrews, Fisher, Campuzano, Fawcett, & Berkley-Patton, 2000) and related approaches used by the sites were documented (e.g., the use of AmeriCorps workers as lay health workers).

Intervention

Implementation of the Coordinated Care Model. Implementation of the coordinated care approach included delivery of three main intervention components: a) a comprehensive, multi-level DSME program; b) PCMH designation—a national accreditation process intended to assure high-quality health care standards including team-based medical practice, whole-patient orientation, integrated/coordinated care (integration/coordination across all elements of the healthcare system, including hospitals, subspecialty care, home health agencies, etc.), quality and safety, enhanced access services, and flexible payment; and c) enhanced programs that targeted the unique needs of underserved populations (e.g., access/linkage to care, diabetes self-management support; see Table 2). Following a 6-month planning period, all sites began delivery of these intervention components (see below) and collected baseline clinical and behavioral

measures by October, 2011. Although program funding concluded by July, 2012, several specific intervention elements continued at some sites and were ongoing when the KU Work Group staff conducted interviews with key informants in May, 2013 (see Figure 1). Table 2 below describes the specific intervention components, elements, and modes of delivery used by the PCMH sites. Implementation of the intervention lasted for approximately 6 months at each site from September, 2011 to July, 2012.

Table 2

AADE Intervention Components, Elements, and Modes of Delivery

Intervention Component/ Behavior Change Strategy	Specific Intervention Elements	Modes of Delivery
Diabetes Self-Management Education—*Providing information and enhancing skills*	Behavior-change curricula aimed at addressing patient health behaviors identified in the AADE7 Self-Care Behaviors™: a) Healthy eating b) Being active c) Monitoring blood glucose d) Taking medication e) Problem solving f) Reducing risks for disease progression g) Healthy coping Sites included: JUDI, DIOU, HHDC, DRTC Individual and group-based ad hoc education sessions to increase health literacy; included enhanced nutrition education Sites included: JUDI, HHDC	Certified diabetes educators facilitated both individual and group DSME sessions. Health coaches supplemented DSME with curricula to enhance health literacy and enhanced nutrition education.
Support for Managing Diabetes and Distress—*Enhancing services and support*	Support group for diabetes patients Sites included: HHDC	Patient-led support groups assisted patients in coping with diabetes-related distress.

	Diabetes self-management support Sites included: JUDI, DIOU, HHDC	Health coaches performed follow-up phone calls with patients to review and promote self-management behaviors.
	Cooking classes featuring diabetes-compatible recipes and demonstrating use of healthy ingredients Sites included: JUDI, DRTC	Project staff delivered cooking classes to participants via a mobile kitchen at a local community center.
Enhanced Access/Linkage to Care—*Modifying access, barriers, and opportunities*	Delivery of home and at-work follow-up care for patients with chronic diabetes who did not meet scheduled medical appointments (e.g. Home Evaluation Assessment and Treatment Program, Site Evaluation Assessment and Treatment Program) Sites included: JUDI	Medical assistants sought out patients at home or place of employment to provide clinical services.
	Brown-bag outreach meetings at community centers and retirement communities with elderly residents to discuss the importance of diabetes care Sites included: JUDI	Clinic staff conducted these access/linkage to care outreach events at local senior centers to reach elderly residents with diabetes.
	Individualized phone-based linkage-to-care services to patients with diabetes Sites included: DIOU, HHDC Enhanced supports for patients with diabetes provided by patient supports, including providing transportation to treatment appointments and arranging home visits Sites included: JUDI, DIOU, HHDC	Community health workers and health coaches contacted patients via telephone to connect them with community supports for diabetes management and to provide transportation to clinic services.
Improve Quality of Care—*Modifying policies and broader systems*	Incorporation of Level 1 (community health workers) and Level 2 (healthcare workers with limited experience in DSME) educators within the delivery of the DSME curricula to provide culturally-relevant diabetes self-management information and support	Implementation of the coordinated care approach within PCMHs established multi-level DSME delivery, coordinated care teams,

	Sites included: DIOU, HHDC	and the use of electronic patient medical records for coordination and assurance of diabetes standard of care.
	Electronic patient medical records used to coordinate services	
	Sites included: JUDI, HHDC	
	Coordinated patient care teams (e.g., primary care doctor, nurse care coordinator, certified diabetes educator, and health behavior coach)	

Note. DIOU = Diabetes Institute at Ohio University; JUDI = Jacksonville Urban Disparities Institute; AADE = American Association of Diabetes Educators; CDC = Centers for Disease Control and Prevention.

Analysis

This evaluation research used an empirical case study design (Yin, 2009). In this explanatory case-study design, the research inquiry describes the facts of the case and draws conclusions based on the available evidence (Yin, 1981). The intervention's implementation is measured systematically and communicated descriptively and visually using a cumulative record. Data analyses were completed by the author using IBM SPSS Statistics for Windows (Version 22.0). A paired-sample *t* test was performed to examine within-subject clinical outcome data for all participants who completed both baseline and follow-up sessions. To test the relationship between implementation and clinical outcomes, a Pearson product-moment correlation coefficient was calculated between the number of services provided during the implementation period and the mean clinical outcomes. An a priori α of .05 was used on all statistical tests.

Results

Data on Implementation of the Coordinated Care Model

Research Question 1: How were the elements of the coordinated care model implemented across a multi-site diabetes self-management and support initiative? The data gathered during the key informant interviews and document review resulted in 151 discrete activities and efforts to implement the coordinated care model across all sites. The majority of documented activities (n = 132) were services provided to implement of the intervention, see Table 3. Illustrative examples of these service activities included the delivery of DSME, diabetic cooking classes, and community outreach events. The next most frequently documented activity were community/system changes (n = 15). Examples of community/system change (i.e., new or modified programs, policies, or practices) included implementation of the AADE DSME curricula in one-on-one education sessions with participants, implementing a participant-facilitated diabetes support group, implementing the new practice of using a Nurse Care Coordinator to direct diabetes patient workflow using electronic patient medical records. Table 3 also shows differences in the number of documented activities across sites, for instance, the number of services provided range from 61 at JUDI to 8 at the Vanderbilt DRTC.

Table 3

Aggregate and Site-Specific Activities for the Implementation of the Coordinated Care Model

Site	CC	CA	DA	SP	DE	RG	Total†
JUDI	7	0	0	61	2	1	65
DIOU	2	3	1	9	0	4	18
HHDC	3	0	2	54	0	0	56
DRTC	3	0	2	8	1	0	12
Total	15	3	5	132	3	5	151

Note. CC = Community/System Change, CA = Community Advocacy, DA = Development Activity, SP = Services Provided, DE = Dissemination Effort, and RG = Resources Generated. JUDI = Jacksonville Urban Disparity Institute, DIOU = Diabetes Institute of Ohio University, HHDC = Harold Hamm Diabetes Center, and DRTC = Vanderbilt Diabetes Research and Training Center. † The total represents the total number of discrete entries, rather than the total of each type of code. For example, Services provided were also assigned the Community/System Change code when they were implemented for the first time, as they met the definition for both. As a result, the sum of each site's codes do not equal the number of discrete entries in the total column.

The implementation of the coordinated care approach occurred over an 11-month period from September, 2011 until July, 2012. (As discussed later, several sites sustained implementation of the intervention components beyond the funded period [JUDI, HHDC]). The number of services provided during the intervention period totaled 132 discrete entries, see Table 3. Discrete entries were the activities that occurred over the preceding month (e.g., daily sessions of DSME). Each discrete activity contained the frequency of sessions that occurred each month, which resulted in 476 discrete sessions over the intervention period across all of the sites. The Jacksonville Urban Disparity Institute (JUDI) implemented 293 sessions, The Diabetes Institute of Ohio University (DIOU) implemented 18 sessions, The Harold Hamm Diabetes Center (HHDC) implemented 156 sessions, and The Vanderbilt Diabetes Research and Training Center implemented nine sessions. Figure 1 displays the number of services provided sessions distributed by Together on Diabetes (ToD) goal. The data collection tool contained the option for attributing each activity to more than one characterization. For example, activities were attributed to more than one goal in some cases (e.g., delivered DSME services may have been

attributed to both improving diabetes self-management and increasing preventive health behaviors) resulting in a total number of sessions (1076) greater than the number of services provided sessions (476).

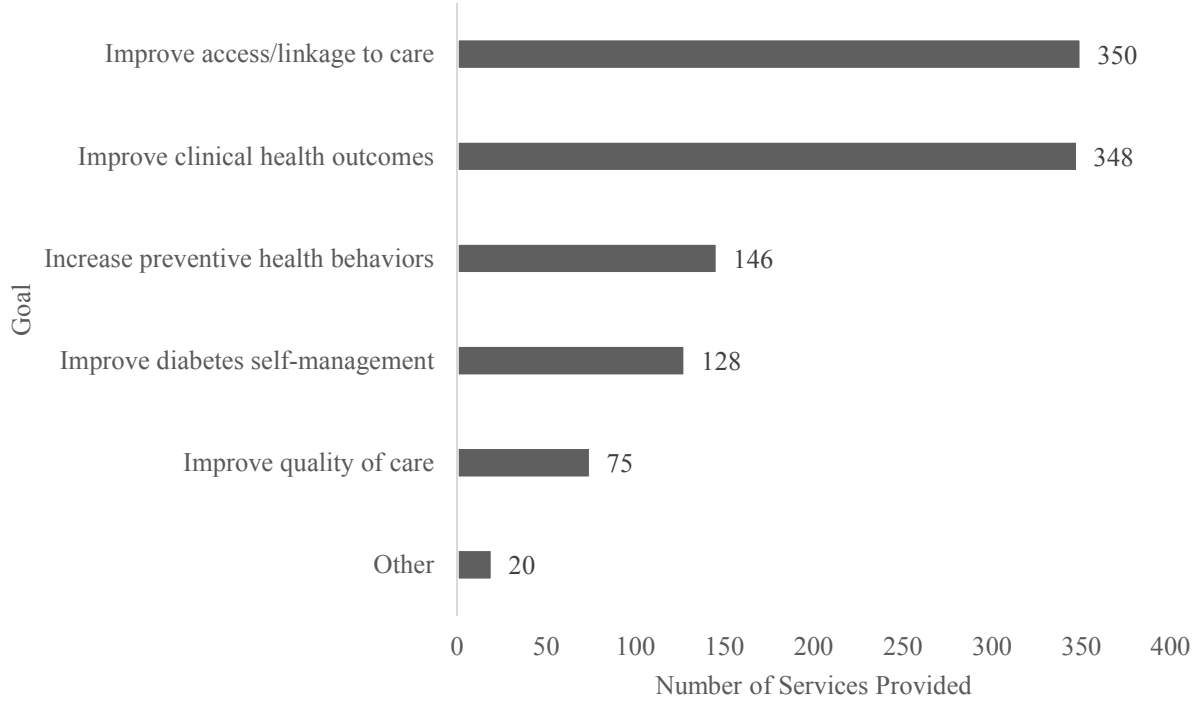

Figure 1. The delivery of services provided across all sites by type of goal.

Panel A in Figure 2 displays the implementation of the intervention—the unfolding of services provided to enrolled patients over time—for all PCMH sites. These data show steady implementation of services provided during the implementation period, with a marked and continued acceleration beginning in September 2012 in the JUDI site. This acceleration was attributed to a single community/system change. For those patients that were unable to meet their needed scheduled medical encounters (e.g., biannual consult with primary care physician, medication titration), JUDI implemented a modification to their Home Evaluation Assessment and Treatment (HEAT) Program. This community/system change consisted of a program aimed

at providing medical care in the patient's home—to provide medical care in settings designated most convenient by the patient themselves (e.g., place of employment). As part of this newly modified program, known as the Site Evaluation Assessment and Treatment Program (SEAT), medical assistants delivered an enhanced treatment plan to diabetes patients that included blood glucose monitoring, insulin titration, and blood pressure assessment. These elements of the intervention were still being implemented when KU Work Group staff conducted key informant interviews. Panel B displays the implementation of the intervention for the Diabetes Institute at Ohio University (DIOU). This cumulative graph displays a steady unfolding of services provided consistent with the implementation of the site's research protocol. The intervention was implemented in December 2011 and concluded by September 2012 resulting in 18 services provided. Panel C displays the implementation of the intervention for the Harold Hamm Diabetes Center (HHDC). The intervention began in September 2011 and was ongoing at the time of data collection. This cumulative graph shows a steady unfolding of services provided with a marked deceleration in February 2013 until the end of the implementation period resulting in 156 services provided. Panel D displays the implementation of the intervention for the Vanderbilt Diabetes Research and Training Center (DRTC). This cumulative graph displays a steady unfolding of services provided as prescribed by the implementation of the Vanderbilt DRTC's research protocol. The intervention was implemented in March 2012 and concluded by December resulting in nine services provided.

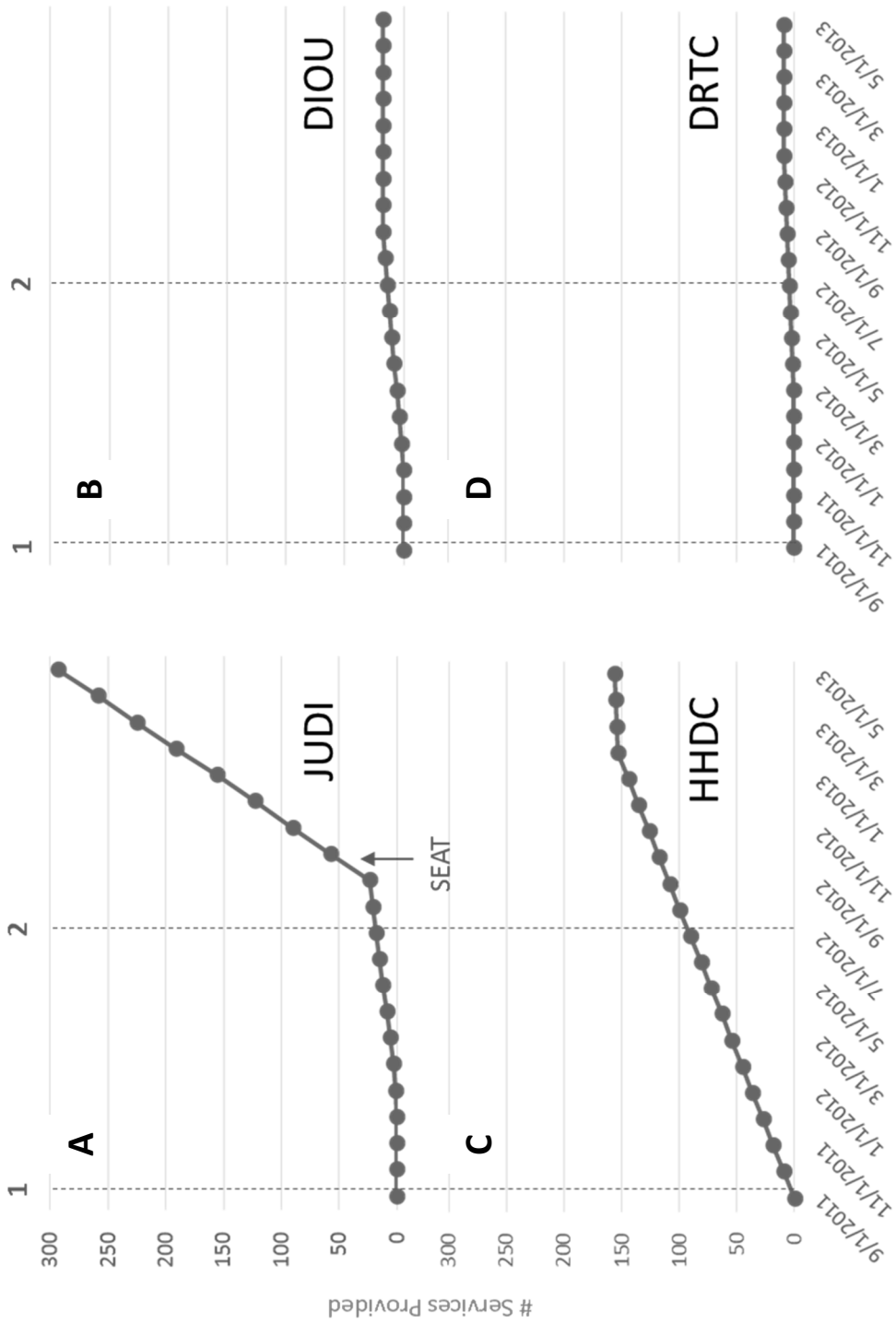

Figure 2. The cumulative unfolding of services provided to implement the intervention over time at the across all sites. Time 1 and Time 2 indicate the points at which baseline and follow-up values were collected, respectively.

Data on Clinical Health Outcomes

Research Question 2: Was implementation of the coordinated care model associated with improvement of clinical health indicators for diabetes and behavioral indicators for diabetes self-management? Data on patient clinical outcomes (i.e., A1C, BMI, SBP, DBP, HDL-C, LDL-C, CT, CITG, and AADE7 Behaviors™) are shown in Table 4. Site and aggregate indicator means and standard deviations are displayed for baseline and 6 months. Within-subject mean difference scores were computed for each site among patients that completed both baseline and 6 month testing ($N = 86$). Paired Student's *t*-tests were performed within each site and across all participants. The implementation of the coordinated care model was successful at decreasing A1C ($M = -0.43$, $SD = 1.60$, $p = .01$) among diabetes patients, see Table 4. Additionally, significant decreases in A1C ($M = -1.07$, $SD = 1.90$, $p = .01$) and Body Mass Index ($M = -0.58$, $SD = 1.00$, $p = .01$) were moved at one of the sites (HHDC), see Table 4. Effect sizes ranged from 0.90 to −0.57 (see Table 4).

During the funded intervention period from September, 2011 to July, 2012 a total of 128 services provided were delivered within all four sites (JUDI = 18, DIOU = 14, HHDC = 90, and DRTC = 6). There was a strong, negative correlation between services provided during the intervention period, a measure of implementation of the intervention, and the mean change in A1C, $r(2) = -.962$, $p = .038$ (see Table 5); increased delivery of the intervention components were associated with improvement in blood glucose. There was no association between services provided during the intervention period and the remaining clinical outcomes (see Table 5).

Table 4

Clinical Outcomes for Enrolled Patients in the AADE Intervention

	Pre-Intervention			Post-Intervention			Within-Patient Difference[a]				
	M	±*SD*	*N*	*M*	±*SD*	*N*	*M*	±*SD*	*N*	*p*	Cohen's *d*[b]
Total HbA1c (%)	9.1	±2.4	173	8.5	±2.1	86	−0.43	±1.6	86	**.01	−0.27
JUDI	9.0	±2.7	83	8.5	±2.5	32	−0.04	±1.9	32	.91	−0.02
DIOU	8.9	±1.6	20	8.3	±1.7	10	−0.18	±1.2	10	.65	−0.15
HHDC	9.5	±2.2	42	8.6	±2.2	29	−1.07	±1.9	29	**.01	−0.56
DRTC	8.8	±1.9	28	8.4	±1.6	15	−0.21	±1.9	15	.67	−0.11
Total BMI (kg/m^2)	36.4	±9.3	160	37.1	±7.0	47	−0.44	±2.1	47	.16	−0.21
JUDI	36.3	±8.5	72	43.4	—	1	−1.26	—	1	—	—
DIOU	37.0	±10.1	19	36.7	±5.1	9	0.53	±2.2	9	.49	−0.24
HHDC	35.2	±8.6	42	35.0	±8.2	27	−0.58	±1.0	27	**.01	−0.57
DRTC	37.1	±11.9	27	33.3	±4.3	10	−0.87	±2.4	10	.28	−0.36
Total SBP (mmHg)	133.5	±18.2	153	134.2	±18.4	67	0.29	±21.5	59	.29	−0.01
JUDI	129.2	±16.9	76	125.7	±19.0	12	3.18	±20.0	11	.61	−0.16
DIOU	134.5	±32.5	11	144.0	±21.8	9	−7.50	±39.7	4	.73	−0.19
HHDC	134.4	±17.1	39	131.5	±18.2	26	−1.40	±17.4	25	.69	−0.08
DRTC	135.8	±15.4	27	135.5	±15.0	20	2.47	±23.8	19	.66	−0.10
Total DBP (mmHg)	78.1	±10.3	153	77.2	±10.1	67	−1.32	±12.4	59	.42	−0.11
JUDI	77.3	±10.0	76	74.5	±7.4	12	−1.82	±8.7	11	.51	−0.21
DIOU	77.8	±13.4	11	80.2	±15.6	9	−3.75	±21.8	4	.76	−0.17
HHDC	79.2	±10.7	39	75.4	±10.2	26	−2.76	±12.4	25	.28	−0.22
DRTC	78.0	±9.9	27	78.8	±8.3	20	1.37	±12.4	19	.64	−0.11
Total HDL-C (mg/dL)	47.7	±22.0	129	44.6	±16.7	63	3.39	±18.5	54	.14	−0.18
JUDI	52.7	±22.0	76	48.1	±17.4	32	1.94	±12.6	31	.40	−0.15
DIOU	47.4	±10.6	8	40.4	±6.9	7	0.67	±4.5	3	.82	−0.15
HHDC	50.0	±26.7	28	48.1	±22.9	14	2.83	±31.0	12	.75	−0.09
DRTC	40.8	±14.6	17	41.6	±6.0	10	10.88	±20.8	10	.13	−0.52
Total LDL-C (mg/dL)	90.8	±39.1	130	95.4	±32.8	61	−4.41	±31.5	49	.33	−0.14
JUDI	97.3	±35.9	75	97.8	±29.0	28	−2.62	±26.0	26	.61	−0.10
DIOU	70.9	±24.8	7	117.7	±45.3	7	28.33	±54.2	3	.46	1.25
HHDC	94.7	±35.8	26	89.3	±32.6	13	−8.00	±22.7	10	.30	−0.35
DRTC	100.4	±53.7	22	76.9	±26.2	13	−15.30	±41.7	10	.28	−0.37
Total CT (mg/dL)	179.8	±46.4	129	173.8	±42.5	63	−9.33	±58.9	51	.26	−0.16
JUDI	175.1	±37.6	76	167.0	±62.2	32	−6.69	±41.0	29	.39	−0.16
DIOU	169.1	±53.1	8	199.0	±51.1	7	29.33	±57.0	3	.47	0.51
HHDC	176.7	±32.6	28	182.2	±37.2	14	8.00	±24.9	12	.29	0.32
DRTC	198.3	±83.8	17	146.9	±28.2	10	−66.57	±116.9	7	.18	−0.57

Table 4 cont.

Total CITG (mg/dL)	171.3	±89.7	127	173.7	±84.0	67	15.45	±86.3	49	.22	0.18
JUDI	139.7	±78.5	76	136.4	±62.2	37	0.25	±77.4	28	.98	0.00
DIOU	222.9	±121.0	8	204.0	±91.8	7	−1.00	±20.7	3	.94	−0.05
HHDC	152.4	±85.3	27	206.6	±115.6	13	53.58	±123.5	12	.16	0.43
DRTC	170.0	±116.6	16	147.7	±62.8	10	18.33	±20.4	6	.08	0.90
Total AADE7 Behaviors™	2.7	±0.3	172	2.7	±0.3	52	0.42	±0.4	52	.50	0.05
JUDI	2.7	±0.2	83	—	—	—	—	—	—	—	—
DIOU	2.6	±0.3	20	2.9	±0.1	7	0.05	±0.2	7	.40	0.12
HHDC	2.7	±0.2	42	2.7	±0.2	28	0.06	±0.3	28	.30	0.15
DRTC	2.5	±0.5	27	2.7	±0.4	17	0.21	±0.6	17	.21	−0.03

Note. HbA1c = Glycosylated Hemoglobin; BMI = Body Mass Index; SBP = Systolic Blood Pressure; DBP = Diastolic Blood Pressure; HDL-C = High Density Lipoprotein Cholesterol; LDL-C = Low Density Lipoprotein Cholesterol; CT = Cholesterol, Total; and CITG = Cholesterol Triglyceride. JUDI = Jacksonville Urban Disparity Institute, DIOU = Diabetes Institute of Ohio University, HHDC = Harold Hamm Diabetes Center, and DRTC = Vanderbilt Diabetes Research and Training Center. **significant at the .01 level. Cohen's *d* effect sizes are defined as small = 0.20, medium = 0.50, and large = 0.80 (Cohen, 1988). Negative Cohen's *d* values indicate physiologic improvement.

[a]Within-patient analysis was conducted on those individuals who completed pre- and post-intervention assessments.

[b]Cohen's *d* effect sizes are defined as small = 0.20, medium = 0.50, and large = 0.80 (Cohen, 1988).

Table 5

Association between Implementation of the Intervention and Clinical Outcomes

		A1C	BMI	SBP	DBP	HDL-C	LDL-C	CT	CITG
SP ($N = 4$)	*r*	−.962	−.032	−.096	−.396	−.292	−.240	.366	.889
	p	*.038	.968	.904	.604	.708	.760	.634	.111

Note. SP = Services Provided; A1C = Glycosylated Hemoglobin; BMI = Body Mass Index; SBP = Systolic Blood Pressure; DBP = Diastolic Blood Pressure; HDL-C = High Density Lipoprotein Cholesterol; LDL-C = Low Density Lipoprotein Cholesterol; CT = Cholesterol, Total; and CITG = Cholesterol Triglyceride. *significant at the .05 level.

Data on Sustainability of the Intervention

Research Question 3: How were the elements of the coordinated care model of the diabetes initiative sustained beyond the initial grant funding? Several components and elements of the intervention were sustained beyond the funding period. Eleven elements of the intervention were sustained or continued beyond the grant period. In total, four tactics for sustainability were used: 1) Becoming a line item in an existing budget of another organization; 2) Incorporating the initiative's activities or services into another organization with a similar mission; 3) Appling for grants; and 4) Soliciting in-kind support (Community Tool Box, 2013). Illustrative examples of specific approaches include: a) the institutionalization of the Jacksonville Urban Disparity Institute's Diabetes Rapid Access Program into their normal diabetes care practice; b) demonstration of AADE's organizational capacity for network engagement to seek CDC funding for a national diabetes prevention programming initiative; c) and the use of AmeriCorps workers to provide patient diabetes self-management support and access/linkage services (see Table 6).

Table 6

Intervention Elements Sustained and Associated Tactics Used for Sustainability

Intervention Element Sustained/Related Components	Tactic for Sustainability Used
The type 2 diabetes access/linkage to care navigator that was associated with this project (DIOU) was hired by the local school district to provide similar navigation services to children with type 1 diabetes following the grant period. (Enhanced Assess/Linkage to Care) A mobile kitchen—a practice change planned during the implementation of the intervention—was integrated into DSME enhanced nutrition classes offered at a local community center at the conclusion of the grant funding (DIOU). (Diabetes Self-Management Education) The SEAT Program (JUDI), developed during the period of program delivery, was implemented 2 months after the conclusion of the project funding. (Enhanced Assess/Linkage to Care) The D-RAP Program (JUDI) became the standard of care for DSME among Jacksonville diabetes patients and continued beyond the funding period. (Improve Quality of Care) The community health worker at HHDC was retained to continue education and patient support. (Enhanced Assess/Linkage to Care)	1) Become a line item in an existing budget of another organization—Convince another organization to pick up part of the expenses of running the initiative (e.g., the city provides funding for a school health program).
AADE, in partnership with the University of Florida Health Jacksonville, applied for and was chosen for evaluation as part of the CDC's Million Heart Campaign initiative to establish practice recommendations for addressing chronic disease, including diabetes. (Improve Quality of Care)	2) Incorporate the initiative's activities or services into another organization with a similar mission
AADE submitted a CDC grant to scale the efforts of improving the availability of diabetes prevention programming. The pilot program funded by the Bristol-Myers Squibb Foundation was used as a demonstration for AADE's capacity for network engagement and the implementation of sustainable programming. (Improve Quality of Care)	3) Apply for grants—Consider time and resources that will be necessary for success, and the need for reapplication.

Table 6 cont.

Bristol-Myers Squibb Foundation Together on Diabetes funded an AADE Phase 2 project. This is focused on implementing and evaluating a model for delivery of integrated DSME and DSMS to high disparity populations. It utilizes a multi-level team consisting of diabetes educators and patient supporters, similar to those strategies used in the Phase 1 demonstration project. (Support for Managing Diabetes and Distress)	
The Vanderbilt DRTC leveraged funding to expand the implementation of the model across additional PCMHs in Tennessee in the first steps to establish an Affordable Care Organization. (Improve Quality of Care)	
The Vanderbilt DRTC received an award to increase their capacity for coordinated chronic care delivery through inter-professional healthcare teams and advanced health information technology. This award was made possible by becoming a PCMH, a requirement for the AADE coordinated care model. (Improve Quality of Care)	
DIOU sought and used AmeriCorps volunteers as lay health workers to deliver access/linkage to care services. (Enhanced Assess/Linkage to Care)	4) Solicit in-kind support—Seek goods and services the organization would otherwise have to purchase (e.g., donations of office supplies from a local business).

Note. DIOU = Diabetes Institute at Ohio University, SEAT = Site Evaluation Assessment and Treatment Program, JUDI = Jacksonville Urban Disparities Institute, HHDC = Harold Hamm Diabetes Center, DRTC = Vanderbilt Diabetes Research and Training Center, AADE = American Association of Diabetes Educators, CDC = Centers for Disease Control and Prevention, PCMH = Patient Centered Medical Home.

Discussion

Research Question 1: How were the elements of the coordinated care model implemented across a multi-site diabetes self-management and support initiative?

The majority of the 151 documented activities in the four Patient Centered Medical Homes (PCMH) were in the form of services provided (n = 132) delivered to patients and community residents through a collaborative team approach. These activities typically included diabetes self-management education (DSME), home-based health care, and community outreach and screening events.

The PCMH sites were of two types. Two sites, the Diabetes Institute at Ohio University (DIOU) and the Vanderbilt Diabetes Research and Training Center (DRTC) in Tennessee, implemented the intervention to test the feasibility of the multi-level team approach with DSME within small-sample pilot studies. These sites, DIOU and the Vanderbilt DRTC, measured the fidelity to the implementation of the coordinated care model during the brief, pilot period. Understanding implementation fidelity is a key consideration for the planning of future programs, policies, and practices (Carroll et al., 2007). As a result, services provided at the DIOU and the Vanderbilt DRTC sites were limited to the number of DSME sessions determined by their research protocols.

The two remaining sites, the Jacksonville Urban Diabetes Institute (JUDI) and Harold Hamm Diabetes Center (HHDC) in Oklahoma, integrated the delivery of the model as a practice change within their organizations. Both JUDI and HHDC took an approach to implementing the coordinated care model that occasioned the introduction of additional programs, policies, and practices not originally proposed. As a result, these sites developed and adopted diabetes care strategies that were informed by the performance of particular strategies and patient feedback.

For example, JUDI modified an underperforming approach, the Home Evaluation Assessment and Treatment Program, to expand diabetes care to settings beyond patient homes. Delivered by medical assistants, JUDI was able to enhance access to patients that had missed scheduled clinic visits and could not be reached at home during the operating hours of the healthcare provider. This practice change was implemented as a result of the low rate of success of JUDI staff for connecting with diabetes patients in their homes.

The differences between implementation aims and approaches produced a dissimilar amount of services related to diabetes treatment and support. Those sites that implemented the coordinated care model as a practice change (i.e., JUDI, HHDC) produced many more discrete services provided ($N = 449$) than the PCMH's that restricted the implementation to testing feasibility and fidelity of the coordinated approach (i.e., DIOU, DRTC; $n = 27$). It is important to note, however, that both JUDI and HHDC, as a result of integrating the coordinated care model into preexisting diabetes treatment programs, continued to deliver elements of the intervention well beyond the funding period. This fact alone could account for the variability in treatment volume.

Examining the types of implemented services provided may also help explain the differences in the amount delivered by each site. The documented services provided at DIOU and the Vanderbilt DRTC were nearly exclusive to DSME sessions, consistent with their approach testing feasibility and fidelity of the coordinated care model. Patients receiving diabetes care at these sites experienced about one session per month. In contrast, JUDI and HHDC offered DSME follow-up support (e.g., patient-led support groups for supplemental diabetes education, coping, and peer support) in addition to the education curricula, resulting in a disproportionately higher number of services provided, and differential effects among clinical outcomes at one site

(HHDC), in comparison to providing DSME alone. It is no surprise that interventions that offered DSME and follow-up support delivered a higher volume of diabetes treatment services to participants than interventions that contained DSME alone.

Research Question 2: Was implementation of the coordinated care model associated with improvement of clinical health indicators for diabetes and behavioral indicators for diabetes self-management?

The results of this study suggest that using an integrated, coordinated care model that combines diabetes self-management education (DSME) within the Patient Centered Medical Home (PCMH) model is an effective approach for reducing glycosylated hemoglobin (A1C), the primary clinical outcome for diabetes. A within-patient analysis detected clinically meaningful (Kilpatrick, Rigby, & Atkin, 2008; Wing et al., 1987) and statistically significant improvement in A1C across all patients that completed blood glucose testing at baseline and at 6 months, see Table 4. Additionally, this within-patient clinical improvement of A1C and body mass index (BMI) was also detected within one PCMH (Harold Hamm Diabetes Center [HHDC]). Improvement to clinical health outcomes within a relatively short time, especially HbA1c, is an effect of particular interest. The delivery of similar DSME interventions have produced mixed improvement to A1C after 6 months (Berikai et al., 2007; Tang, Funnell, Noorulla, Oh, & Brown, 2012; Utz et al., 2008). Understanding the differential effects seen between the various AADE implementation sites—improvement to A1C ($M_{\Delta} = -1.07 \pm 1.9$, $p = .01$) and BMI ($M_{\Delta} = -0.58 \pm 1.0$, $p = .01$) was detected at only one site (HHDC) —may illuminate a promising approach for improving clinical measures for diabetes.

Three sites failed to detect improvement within clinical health outcomes. There are several plausible explanations. Of the 173 patients that participated in the American Association

of Diabetes Educators' (AADE) study, only 86 completed the follow-up clinical assessments at 6 months; among those, the site with the highest proportion of patients that completed the intervention was the same site that detected clinical improvement (HHDC). The proportion of those that completed both baseline and follow-up at 6 months varied widely between sites. The proportion of those patients that completed the intervention among three sites (JUDI, DIOU, Vanderbilt DRTC) showed no improvement to A1C values, varied from 38.5% to 53.5%. These proportions are low relative to the 69.0% of patients that completed HbA1c measurement at baseline and at follow-up at the HHDC site. This disparity is even greater for BMI, ranging from 1.4% to 47.4% for JUDI, DIOU, and Vanderbilt DRTC, compared to 64.3% of HHDC patients that completed both the baseline and follow-up measurement of BMI. The low proportion of patients that had completed both the baseline and 6-month follow-up for each of the remaining clinical outcomes ranged from 36.4–42.8% with sample sizes ranging from 1–31 patients per site. It is likely that the effect of the intervention was not detected within such a small sample of individuals and the ability to detect clinical improvement underpowered, as a sample size of at least 29 patients were needed to detect improvement of medium effect.

It is also possible that the intervention delivered at HHDC was more effective than those implemented at the three remaining sites. Again, while this is suggested statistically, it is unlikely that the intervention varied to the point to where improvement to clinical outcomes was not possible. A combination of factors, including underpowered statistical analyses, and relatedly, the existence of confounding covariates difficult to control for among small samples is the most likely explanation for differential effects of clinical health outcomes between sites. This may have led to a selection bias among the remaining patients. Additionally, it is possible that

increased opportunity for patients to have received services, may also partially account for clinical outcome improvement for one of the four sites.

The number of services provided was associated with improvement to A1C, that is, as services provided increased, A1C decreased (see Table 5). In addition to HbA1c and BMI improvement, HHDC delivered markedly more services provided during the funded intervention period (September 2011, to July, 2012) than the other three sites. While not surprising, these results provide some evidence that increased delivery of intervention components can lead to improvement in A1C. Although individual patient data on intervention component exposure was not available, previous research has demonstrated a relationship with improvement in A1C and dosage of community health worker (CHW) contact (Thompson, Horton, & Flores, 2007). Implementation at HHDC included CHW-led peer support groups in addition to a certified DSME curriculum during the funded period. The combination of these services provided produced a markedly higher volume of intervention dose during that time in comparison to the other PCMHs. The disproportionately higher number of services provided by HHDC were associated with the site's improvement to A1C.

Research Question 3: How were the elements of the coordinated care model of the diabetes initiative sustained beyond the initial grant funding?

Ultimately, the implementation of the coordinated care model was considered a success by the American Association of Diabetes Educators (AADE) and by those sites that had delivered the approach. The project goal of demonstrating the integration of diabetes self-management education (DSME) within four diverse, patient-centered medical home (PCMH) settings was achieved. Additionally, both patients and staff indicated high levels of satisfaction with the approach. As a result, several elements of the intervention were sustained beyond the

implementation period. Both the fidelity-level and the community practice-level implementation sites retained features from the intervention within their respective diabetes care practices (see Table 6).

Context for sustainability. The diverse settings within which care teams implemented the coordinated approach varied widely. As a well-established PCMH addressing chronic disease and diabetes, the Jacksonville Urban Disparity Institute (JUDI) sought to integrate the delivery of DSME within their current practice of patient-centered care. JUDI implemented the AADE coordinated care model as a practice change to their existing, Diabetes Rapid Access Program ([D-RAP]; Centers for Disease Control & Prevention, 2013b). Previous research had shown the D-RAP to be effective at improving glycosylated hemoglobin (A1C) among patients receiving diabetes care at JUDI (Lee, Palacio, Alexandraki, Stewart, & Mooradian, 2011). Specifically, the implementation of the coordinated care model within the JUDI PCMH ensured the delivery of DSME for all patients enrolled within the D-RAP program through managed care. Moreover, effective chronic disease self-management are likely to reduce the rate of hospitalizations (Lorig et al., 1999) and associated unrecovered costs, in addition to the potential improved health outcomes. As a not-for-profit health care provider, reducing healthcare costs through improved, coordinated care (Moran, Burson, Critchett, & Olla, 2011) across the entire University of Florida Academic Health Center system was an aim well-aligned with their overall strategic plan (University of Florida and Shands Strategic Planning Cabinet, 2010). This fact likely played an important role in implementing the coordinated care model and related practice changes measured within the current study.

Similarly, the Harold Hamm Diabetes Center (HHDC) in Oklahoma established the AADE-sponsored coordinated care model as practice change within their existing patient-

centered, diabetes treatment program. Established in 2009, the HHDC PCMH serves as a university training center for family medicine physician residents and pharmacy students to deliver patient-centered care. The implementation of the coordinated care model allowed HHDC to include the practice change of integrating a culturally-competent, community health worker (CHW) for the delivery an accredited DSME program to their existing practice. Additionally, HHDC created the conditions for the CHW to tailor patient-centered support beyond what was originally intended. The use of CHWs has been effective in providing moderate return on investment (ROI) an important implication for sustainability (Whitley, Everhart, & Wright, 2006), particularly for the implementation of DSME program (Martin & Lipman, 2013).

The context for sustainability of the coordinated care model differed between projects aiming to test fidelity of implementation—the Diabetes Institute at Ohio University (DIOU) and the Vanderbilt Diabetes Research and Training Center (DRTC)—and those focused on enhancing the practice of implementation. DIOU, created in 2012, is focused on improving population health through basic and applied diabetes research. For this PCMH site, the AADE project allowed DIOU to assess their capacity for addressing diabetes using a multi-level team approach that included CHWs. Lessons learned would later inform future research and changes to the current practice. Similarly, the Vanderbilt DRTC has the mission of discovering effective disease management treatment programs through interdisciplinary, translational research. With the support of AADE, the Vanderbilt RDTC sought to test the feasibility and fidelity of the pilot study by evaluating patient- and program-level outcomes by integrating the coordinated care approach within an existing diabetes treatment program. The differences in context and the intended aims of implementing the coordinated model between the fidelity- and practice-level implementation sites help explain the conditions that supported sustainability, what elements of

the intervention persisted, and what new practice and features resulted from the result of this work.

Elements of the intervention that were sustained. Several of the intervention elements were sustained beyond the funding period within two of the PCMH model sites. Carried out in September 2012—2 months after the project's conclusion—the Jacksonville Urban Disparity Institute (JUDI) implemented the Site Evaluation Assessment and Treatment Program (SEAT) as a change to their existing diabetes practice of engaging patients within the home setting. This practice change markedly increased the volume of services provided with JUDI patients from three services provided to 33 services provided per month. The challenges that arose from repeated attempts of medical assistants to reach patients at their homes created the need for an even more comprehensive service that provided patient access and linkage to diabetes care. Further, the JUDI PCMH continued to integrate the multilevel patient DSME curriculum within their established Diabetes Rapid Access Program (D-RAP) beyond the conclusion of the grant funding as an institutionalized practice change.

Similarly, the Harold Hamm Diabetes Center (HHDC) retained the services of their community health worker (CHW) at the conclusion of the funding period. Clinical improvement to diabetes health outcomes and patient satisfaction through culturally-proficient care highlighted the need to sustain the use of CHWs within the coordinated care practice. The elements of the intervention—DSME, patient outreach and support, and a facilitated peer-support group—were institutionalized into the PCMH's standard of care. The efforts taken to sustain these elements beyond the project implementation period by JUDI and HHDC offer evidence toward the feasibility of implementing the AADE coordinated care model within two well-established diabetes care settings.

Sustainability beyond the intervention. There were also a number of practice changes and initiatives that occurred related to the AADE feasibility pilot study. Although clinical improvements were not detected within the Vanderbilt Diabetes Research and Training Center (DRTC) Patient Centered Medical Home (PCMH), lessons learned from implementing the coordinated approach had lasting effects. By building the capacity to delivery coordinated care to patients with chronic disease, the Vanderbilt DRTC was able to leverage a substantial amount of resources—$18 million—for expanding this coordinated care model. This was part of the initial steps for creating an Accountable Care Organization (ACO)—a network of coordinated care centers aimed at improving patient health outcomes and reducing the cost of healthcare for Medicare beneficiaries (Fisher, Staiger, Bynum, & Gottlieb, 2007). The PCMH and the ACO models, incentivized by the Affordable Care Act, are viable strategies for assuring coordinated quality care (Kocher, Emanuel, & DeParle, 2010). Additionally, the Vanderbilt DRTC's PCMH designation and readiness for coordinated care delivery helped Vanderbilt University School of Medicine receive a MyHealth Team award for improving chronic disease management for high-risk patients within rural Tennessee and Kentucky counties, including those with diabetes. These resources will build upon their work in establishing a multi-level care team and enhanced health information technology.

The Diabetes Institute at Ohio University (DIOU) used four AmeriCorps to deliver diabetes patient support and linkage to care services, including creating environmental arrangements to make healthy lifestyle choices easier and more likely. Positive feedback from patients that that participated intervention created the opportunity for one AmeriCorps CHW to provide similar supports for children with type 1 diabetes beyond the conclusion of the

intervention. The type 1 navigator was later hired by local school district into a newly-created, full-time position.

The collaboration between JUDI and AADE in implementing the coordinated care model led to additional partnerships for preventing and managing chronic disease. Together, these partners applied for and received resources for conducting evaluation as part of the United States Center for Disease Control and Prevention's (CDC) Million Heart Campaign initiative to develop and establish practice recommendations for addressing chronic disease, including diabetes. Specifically, this effort aims to lower the prevalence of the leading risk factors for cardiovascular disease (Centers for Disease Control and Prevention, 2011). The coordinated care pilot study demonstrated AADE's capacity to engage provider networks and implement sustainable diabetes treatment and prevention programs. This demonstration positioned AADE as an implementation partner of CDC's National Diabetes Prevention Program (DPP)—an effort to qualify the Lifestyle Change Program as an insurance-covered healthcare expense.

Feasibility testing of the coordinated care model within four diverse diabetes care sites, using a multi-level care team to integrate DSME within the PCMH practice setting, had allowed for AADE to refine and further test the approach. The demonstration of built capacity for multi-site diabetes project management enabled further support from the Bristol-Myers Squibb Foundation to fund Together on Diabetes (ToD) Phase 2 project in partnership with AADE. This AADE Phase 2 project aims to assess the effects of multi-level coordinated care teams implementing DSME within PCMHs with diabetes self-management support (DSMS) compared to those DSME programs without DSMS. Taken together, the AADE feasibility pilot study featured in the current research led to a number of changes. These changes include sustained elements of the implementation of the intervention and the leveraging of additional funding to

advance similar initiatives. These are perhaps the most compelling findings from the current research.

Limitations of the Study

There were a number of limitations within the current study. First, the cross-site evaluation was retrospective, and as a result, conducted after the conclusion of the funding period. This restricted the depth of the evaluation, which was designed to be conducted prospectively by site staff through an ongoing capture of activities related to the initiative. Additionally, the evaluation is designed to be participatory with shared data sensemaking with partners that create opportunities for continuous improvement. While collaborative reflection of these data was performed with AADE staff, evaluation after the fact made continuous improvement for the intervention impossible. Retrospective data collection also limited the completeness of the program documentation in comparison to a prospective data collection protocol. As a result, development activities, and those efforts related to project planning were not captured as completely as they might have otherwise by site staff documenting activities prospectively. Consequently, little is known regarding the discrete activities related to planning and preparing the intervention for delivery.

All of the data were gathered via self-report by key informants months after implementation of the intervention and associated activities. This fact may have affected the completeness and accuracy of what activities were recorded in both type and kind. For example, it is likely that many of the practice changes that would have resulted from planning prior to the intervention (e.g., creation of multi-level coordinated care teams, adjustments to measurement within electronic patient medical record systems, modified policies that enabled delivery) were not captured through key informant interviews. The resulting measurement bias more readily

recalled activities that had occurred more recently were more likely to be captured; not those activities that had occurred years prior. Prospective data collection allows for the capturing of activities related the implementation of the intervention as they occur. Accordingly, it is likely produce a more complete capture, coding, characterization, and communication of the features of the intervention or independent variable.

There were a number of limitations to the interpretation of the diabetes clinical measures. The study samples within each site were small and varied in method for recruitment and selection. This made these samples particularly sensitive to participant attrition over time. Of the 173 patients that completed baseline assessment, less than half completed 6-month follow-up testing, ranging from 1–32 across sites. It might be that small to modest effects would have been masked due to the weak power of this study, with only very large effects able to be detected; or that the resulting sample displayed no improvement as a result of selection bias. Also, these data were not adjusted for confounding. Due to the relatively small sample size, the analysis assessing clinical differences between baseline and follow-up did not control for important covariates (e.g., patient glycosylated hemoglobin levels at baseline, age, gender, years since diagnosis), however, within-subjects analysis did serve to eliminate potential between-patient differences.

Additionally, each of the sites utilized a pre-post study design without comparison. The use of comparison sites—either PCMH sites without integrated and accredited DSME programs or practice sites without PCMH designation implementing accredited DSME programs—would have provided evidence that the improvements detected occurred when and only when the intervention was applied by ruling out threats to internal validity. Threats to internal validity that are likely evident in the current study include a history events that may have produced improvement not related to the intervention, experimental mortality, and selection bias.

Lastly, as a feasibility pilot study, the intervention period was very short—only 6 months. This timeframe would have likely only detected improvement among the most successful patients making the greatest improvement to self-care behaviors. It is not known that if given more time or if the above limitations were addressed, if small to moderate effects would have identified.

Strengths of the Study

Despite the limitations, the study had a number of important strengths. First, this is among the first research of its kind to evaluate the implementation, associated clinical health outcomes, and sustainability of a multi-level coordinated care delivery model of diabetes self-management education (DSME) within patient centered medical homes (PCMH). Examining the differential clinical effects across programs suggests a relationship between the amount and kind of implementation elements and improvement with some diabetes and related health outcomes. Despite the limitations of retrospective data collection, data on project implementation helped to document and characterize the intervention actually delivered. Second, participation of four unique care settings, each serving a different population experiencing health disparities, helped to assess the feasibility and generality of the approach. Third, data on project implementation helped to capture, code, characterize, and communicate elements of the intervention actually delivered. Quantifying the study's implementation activities communicates the amount of intervention available to participants and may be an important implementation variable that helps explain differential affects and report fidelity. Finally, analyzing the implementation data of the model through visual inspection of cumulative records allowed for the identification of accelerations and decelerations over time and associated factors and changes in implementation.

Conclusions

This evaluation research case study extends the evidence base for the effectiveness of a coordinated care model that incorporates diabetes self-management education (DSME) within patient centered medical homes (PCMH). It shows association between services implemented and improved glycosylated hemoglobin (A1C) and body mass index (BMI). Clinical improvement to A1C was associated with the number of discrete services provided over the implementation period. The latter conclusion is consistent with the project's logic model, or theory of change, that hypothesized that the creation of service/patient engagement opportunities, would lead to improved clinical health outcomes. Additionally, the built capacity among site stakeholders for integrating DSME with coordinated care produced occasions that contributed to sustainability of elements of the intervention (e.g., the Jacksonville Urban Disparities Institute's modification to and continued implementation of the Site Evaluation Assessment and Treatment Program). It also led to other practice changes and resources generated (e.g., the Vanderbilt Diabetes Research and Training Center leveraging $18 million for the creation of an Accountable Care Organization network), as well as new initiatives (e.g., partnership between the American Association of Diabetes Educators and the Centers for Disease Control and Prevention National Diabetes Prevention Program). Although further research is needed to extend the evidence base for the effectiveness of multi-level coordinated care teams and DSME integration for improving patient outcomes for diabetes, the current research suggests the promise of this approach. Assuring accessible diabetes care for those experiencing disparity is essential to reduce health inequality and social justice.

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Appendix A

ToD Monitoring and Evaluation System: Indicators and Measurement Approach

Grantee Name:

Broad Project Goal:

ToD Goals/ *Evaluation Questions*	**Indicators/Target**	**Source/Measurement method**	**Frequency of measure-ment**	**Responsible Person**	**Related Activities**
Goal 1: Improve patient self-management education					
Is patient self-management education being implemented?	#/type Education sessions	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF
	#/type Personalized messages				
Goal 2: Improve access/linkage to care					
Is there improvement in access/linkage to care?	# of undiagnosed patients who are screened	—Project records —Documented in ODSS	Summarized in ODSS after each available measure-ment (e.g., quarterly, annual)	Project documenter	—Bi-annual sense-making and Reports to BMSF
	#/type Navigation services				
	# of diagnosed patients who access services or are reattached to services; other project-specific measures				
	#/type lay health workers trained	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF
	#/type lay health workers engaged with patients				
	# community support referrals				

Goal 3: Improve quality of care					
Is there improvement in quality of care?	HEDIS/Practice measures (e.g., regular foot exams); other project-specific measures	—Project records —Documented in ODSS	Summarized in ODSS after each available measure-ment (e.g., quarterly, annual)	Project documenter	—Bi-annual sense-making and Reports to BMSF

Goal 4: Engage in community organization, mobilization and advocacy					
Are community organization and mobilization efforts occurring?	#/type of Development Activities	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF
Are advocacy efforts occurring?	#/type of Community Advocacy	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF

Goal 5: Facilitate changes in health systems and communities					
Is the initiative bringing about changes in health systems and health service delivery systems?	#/type of Health System Changes #/type of Health Service Delivery System Changes #/type of Policy Changes	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF
Is the initiative bringing about changes in communities related to the mission?	#/type of Community Changes #/type of Policy Changes	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF

Goal 6: Improve self-management, behavioral, and clinical health outcomes					
Is there improvement in self-management outcomes?	Level of diabetes self-care behaviors Level of treatment adherence; other project-specific measures	—Project records —Documented in ODSS	Summarized in ODSS after each available measure-ment (e.g., quarterly, annual)	Project documenter	—Bi-annual sense-making and Reports to BMSF
Is there improvement in preventive health behaviors for participants?	Level of self-reported health behaviors (e.g., physical activity, diet)	—Project records —Documented in ODSS	Summarized in ODSS after each available measure-ment (e.g., quarterly, annual)	Project documenter	—Bi-annual sense-making and Reports to BMSF
Is there improvement in clinical health outcomes for participants?	HbA1c levels/BMI; other project-specific measures	—Project records —Documented in ODSS	Summarized in ODSS after each available measure-ment (e.g., quarterly, annual)	Project documenter	—Bi-annual sense-making and Reports to BMSF

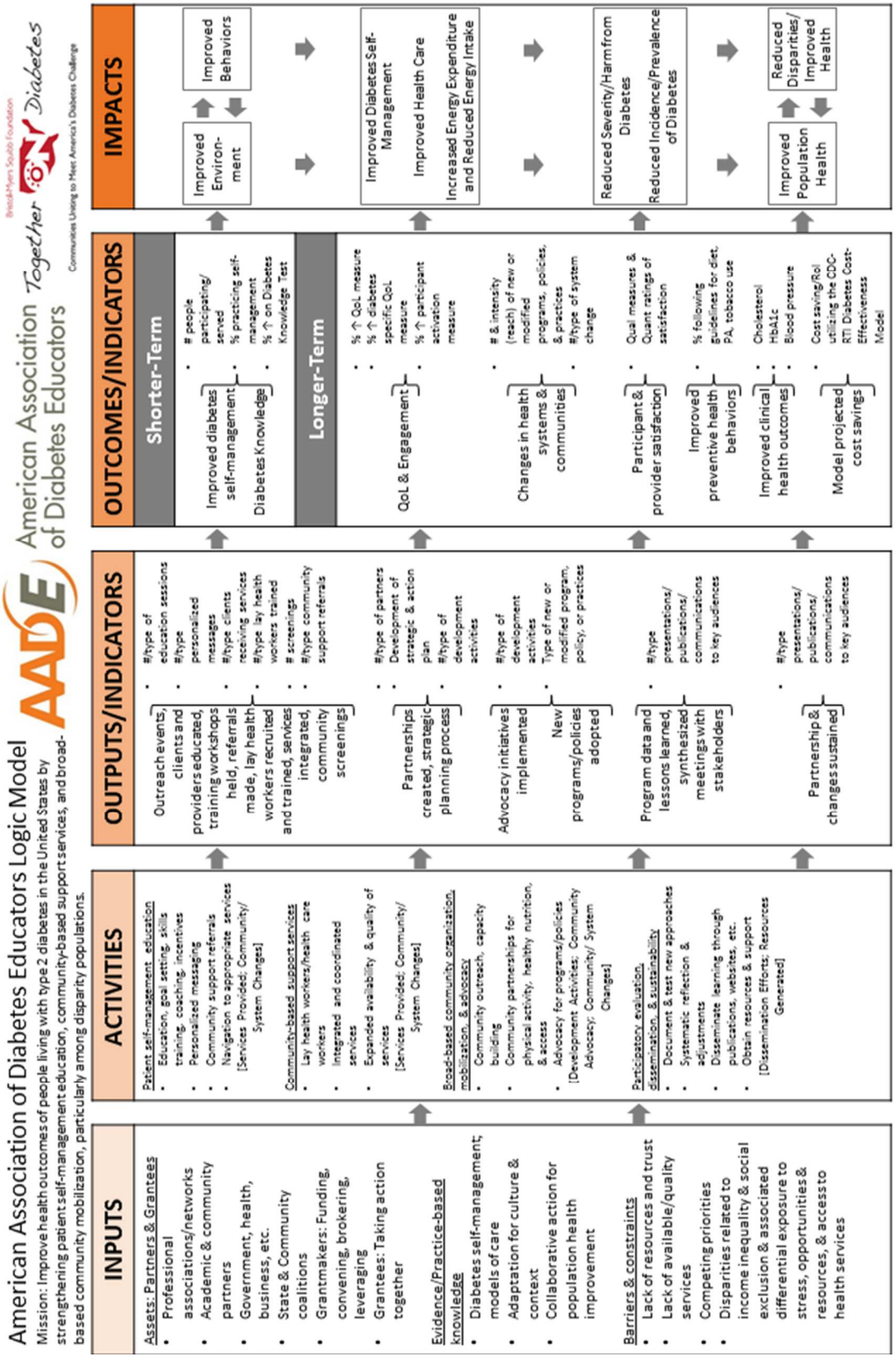
Goal 7: Improve population health					
Is there improvement in population health outcomes in communities?	Diabetes-related ED visits and hospitalizations; other project-specific measures	—Project records —Documented in ODSS	Summarized in ODSS after each available measure-ment (e.g., annual)	Project documenter	—Bi-annual sense-making and Reports to BMSF
Is the initiative reaching priority populations?	# of high burden patients served #/type Outreach activities to priority populations	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF

Goal 8: Improve health equity					
Is the initiative reaching populations disproportionately affected and/or those living in medically underserved areas?	# of high burden patients served (e.g., low-income, African American, Native American, etc.)	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF
	# of medically underserved patients reached				
	#/type of outreach activities adapted to priority populations				
	# of lay health workers from priority populations trained				
	# of activities targeting priority populations				
	# of high burden patients screened				
	# of high burden patients who access services				
	# of high burden patients reporting preventive health behaviors (e.g., physical activity, diet)				
	# of high burden patients reporting self-care behaviors				
	# of high burden patients reporting treatment adherence				
	#/type of dissemination efforts tailored for priority populations				

Goal 9: Engage in dissemination efforts					
Are dissemination efforts occurring?	#/type of Dissemination Efforts (i.e., publications, presentations, reports, other communications)	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF

Goal 10: Sustainability of the initiative and interventions					
Is the initiative generating resources to address the mission?	#/type of Resources Generated	—Project records —Documented in ODSS	Summarized monthly in ODSS	Project documenter	—Bi-annual sense-making and Reports to BMSF
Are Community/ System Changes sustained?	% of Community/ System changes in place at end of project; mode of sustainability used	—Project records —Web-based survey of sustainability	—Once, at conclusion of project	Project documenter, with input from group members	—Project closing sense-making and Final Report to BMSF

Appendix B


American Association of Diabetes Educators Logic Model
Mission: Improve health outcomes of people living with type 2 diabetes in the United States by strengthening patient self-management education, community-based support services, and broad-based community mobilization, particularly among disparity populations.
AADE
American Association of Diabetes Educators
Together on Diabetes
Communities Uniting to Meet America's Diabetes Challenge
Bristol-Myers Squibb Foundation
INPUTS
Assets: Partners & Grantees
Professional associations/networks
Academic & community partners
Government, health, business, etc.
State & Community coalitions
Grantmakers: Funding, convening, brokering, leveraging
Grantees: Taking action together
Evidence/Practice-based knowledge
Diabetes self-management; models of care
Adaptation for culture & context
Collaborative action for population health improvement
Barriers & constraints
Lack of resources and trust
Lack of available/quality services
Competing priorities
Disparities related to income inequality & social exclusion & associated differential exposure to stress, opportunities & resources, & access to health services
ACTIVITIES
Patient self-management education
Education, goal setting, skills training, coaching, incentives
Personalized messaging
Community support referrals
Navigation to appropriate services
[Services Provided; Community/System Changes]
Community-based support services
Lay health workers/health care workers
Integrated and coordinated services
Expanded availability & quality of services
[Services Provided; Community/System Changes]
Broad-based community organization, mobilization, & advocacy
Community outreach, capacity building
Community partnerships for physical activity, healthy nutrition, & access
Advocacy for programs/policies
[Development Activities; Community Advocacy; Community/System Changes]
Participatory evaluation, dissemination, & sustainability
Document & test new approaches
Systematic reflection & adjustments
Disseminate learning through publications, websites, etc.
Obtain resources & support
[Dissemination Efforts; Resources Generated]
OUTPUTS/INDICATORS
Outreach events, clients and providers educated, training workshops held, referrals made, lay health workers recruited and trained, services integrated, community screenings
#/type of education sessions
#/type personalized messages
#/type clients receiving services
#/type lay health workers trained
screenings
#/type community support referrals
Partnerships created, strategic planning process
#/type of partners
Development of strategic & action plan
#/type of development activities
Advocacy initiatives implemented
New programs/policies adopted
#/type of development activities
Type of new or modified program, policy, or practices
Program data and lessons learned, synthesized meetings with stakeholders
#/type presentations/publications/communications to key audiences
Partnership & changes sustained
#/type presentations/publications/communications to key audiences
OUTCOMES/INDICATORS
Shorter-Term
Improved diabetes self-management
people participating/served
% practicing self-management
Diabetes Knowledge
% ↑ on Diabetes Knowledge Test
Longer-Term
QoL & Engagement
% ↑ QoL measure
% ↑ diabetes specific QoL measure
% ↑ participant activation measure
Changes in health systems & communities
& intensity (reach) of new or modified programs, policies, & practices
#/type of system change
Participant & provider satisfaction
Qual measures & Quant ratings of satisfaction
Improved preventive health behaviors
% following guidelines for diet, PA, tobacco use
Improved clinical health outcomes
Cholesterol
HbA1c
Blood pressure
Model projected cost savings
Cost saving/RoI utilizing the CDC-RTI Diabetes Cost-Effectiveness Model
IMPACTS
Improved Environment
Improved Behaviors
Improved Diabetes Self-Management
Improved Health Care
Increased Energy Expenditure and Reduced Energy Intake
Reduced Severity/Harm from Diabetes
Reduced Incidence/Prevalence of Diabetes
Improved Population Health
Reduced Disparities/Improved Health
Context: Large numbers of adult Americans living with type 2 diabetes (25.8 million, 8.3% of population); Limited evidence base and co-learning for assuring widespread diabetes self-management and prevention; Disparities in prevalence of diabetes and access to needed services, especially among African Americans, Native Americans, and Latinos; Need for collaborative action and systems approach to preventing diabetes and assuring access to needed services.

Appendix C

CODING INSTRUCTIONS AND DEFINITIONS for Documenting Accomplishments
Online Documentation and Support System (ODSS)© KU Work Group 2012

By documenting your group's efforts, you are helping make visible what you are accomplishing. Documented activities can be used to promote improvement, accountability, celebrations, and sustainability.

Once you have data entered into the system, you will be able to engage in sensemaking around your documented accomplishments. This will include the ability to look at real-time graphs and ask questions like, "What are we seeing?" "What does it mean?" and "What are the implications for adjustment?"

This document outlines some things that may help you as you get started on documentation, namely, guidance for deciding how to code the information you are documenting.

The table below offers a summary of the codes used to categorize different types of events (activities, accomplishments, or outputs that are facilitated by the initiative or group and related to its goals and objectives)**.**

Brief Definitions for Types of Community Activities, Accomplishments, and Outputs			
Code	**Activity**	**Brief Definition**	**Examples**
ACTIONS/ ACCOMPLISHMENTS			
CC	Community/System Change	A new or modified program, policy, or practice in the community, system, or organization.	New program for diabetes self-management (program), food policy change (policy), different hours of service (practice).
CA	Community Advocacy	Action to bring about a specific new or modified program, policy, or practice in the community or system.	Letters, phone calls, visits with appointed officials.
DA	Development Activity	Actions taken to prepare or enable the group to address its goals and objectives	Worked on developing an assessment, strategic plan, evaluation report, or sustainability
SERVICES			
SP	Services Provided	Delivery of information, training, or other valued goods or activities.	Classes, workshops, communications such as bill stuffers.
DISSEMINATION EFFORTS			
DE	Dissemination Effort	Conveying information about the initiative and its accomplishments to audiences outside the community to be served.	Presentation, publication, distribution of diabetes self-management tip sheet, dissemination of policy brief..
RESOURCES			
RG	Resources Generated	Acquisition of resources for the initiative through grants, donations, or gifts in kind.	Materials, people's donated time, funding received.
OTHER			
O	Other	Items for which no code or definitions have been created.	Phone calls to set up meetings, internal staff meetings.

There are several general considerations in coding events. (More specific definitions, coding instructions, and examples/ non-examples for each of the seven types of events follow.)

Distinguishing between Activities that are External or Internal to the Initiative

Most of your activities will involve people not directly associated with the initiative. For example, group members may work with health organizations to help assure access to screenings or linkages to needed health services. These activities include people from outside the initiative (e.g., clinic staff and participants)) and are considered *external activities*. External activities can be classified as C*ommunity Advocacy, Community/System Changes, Services Provided*, or *Dissemination Efforts*. External activities involve making things happen in the community or system related to the group's goals and objectives.

Some activities facilitate the development of the partnership or group in attaining its goals and objectives. These activities may be internal, involving only those working directly with the group. For example, the Steering Committee may complete their strategic planning process and adopt a formal action plan; or an executive from the initiative's Board of Directors may donate office supplies. *Development Activities* (such as the first example) are internal activities. *Resources Generated* (e.g., volunteers' time, donated materials, or money) are internal activities if the primary beneficiary is your project (not those ultimately served).

Identifying and Documenting Multiple Events Contained in One Entry

A single reported entry may sometimes contain several discrete activities that should actually have been recorded separately. Support the documentation by breaking out the one entry into several items and coding each activity separately. For example, the following entry might be recorded on a log form: "A second diabetes self-management workshop was facilitated in the East End neighborhood. Evaluation results from this effort were reported at a regional diabetes prevention conference." The reported entry includes a *Service Provided*, "A second diabetes self-management workshop was facilitated in the East End neighborhood," while reporting the evaluation efforts at a conference should be documented as a separate entry and would be coded *Dissemination Effort*, "Evaluation results from the self-management workshop effort were reported at a regional diabetes prevention conference."

Documented Activities Coded in Multiple Categories

There are instances where activities can meet multiple definitions. The most likely combination is C*ommunity/System Change* and *Service Provided* (e.g., the first instance of on-site diabetes screening for residents of a public housing project is both a new practice—Community/System Change—and a Service Provided). Other instances in which an activity may meet multiple definitions include when a media activity is also a Community/System change (e.g., Latino radio station covers an issue for the first time).

Relationship between Community Advocacy and Community/ System Change

Community Advocacy and *Community/System Change* generally relate to each other. Keep in mind the goal or outcome of an action when coding it. The purpose of a *Community Advocacy activity* is to make some change in program, policy, or practice related to the group's goals and objectives (a *Community/System Change*). For each *Community Advocacy*, the intended *Community/System Change* should be evident. A person filling out a description may word items to fit a particular category or definition. The evaluator must code the item relative to what actually happened.

Community/ System Changes (CC)

General Definition: New or modified programs, policies or practices in the community, organization, or system facilitated by the initiative and related to its goals and objectives. Changes that have not yet occurred, which are unrelated to the group's goals, or those which the initiative had no role in facilitating are not considered community changes for the initiative. [Note: We use the term "Community/System" and "Community" Changes interchangeably since they represent the same type of activity at different levels (e.g., community/city or broader system) and different sectors (e.g., health or other sectors such as faith communities).

Coding Instructions:

CC1 Community/system changes must meet all of the following criteria:

- CC1.1 have occurred (e.g., when a policy is first adopted; when a new program is first implemented - not just been planned), and
- CC1.2 are related to the initiative's chosen goals and objectives, and
- CC1.3 are new or modified programs, policies, or practices in different parts of the community, organization, or system (e.g., government, business, schools, health organizations), and
- CC1.4 are facilitated by individuals who are members of the initiative or are acting on behalf of the initiative.

CC2 When considering whether an event is new or modified: to be judged as "new," a program, policy or practice must not have occurred before in the effort (e.g., with these groups of people, with these organizations or partners, in these settings, delivered in these ways). To be judged as "modified," a program, policy or practice must be expanded or altered (e.g., a training program was expanded to include new modules, a policy was altered to affect new groups of people, a program was delivered in new organizations or places).

CC3 When considering whether to score multiple events as one instance or as multiple instances of a community/system change: To be judged as multiple instances, changes must be implemented in multiple settings (e.g., different clinics or hospitals) or levels (e.g., local, state levels) AND require separate approvals (e.g., a hospital administrator approved a diabetes self-management program to be taught in her hospital; a second administrator later agreed to do so in his hospital). If the event either occurred in only one setting or occurred as a result of one approval, it is coded as **one** instance of community/system change (e.g., the hospital board agreed to implement a system-wide diabetes self-management program that was implemented in multiple hospitals).

CC4 When multiple entries of the same event are being documented: The recorders involved should discuss how to record the event as a single entry (e.g., the same program implemented in the same place by multiple groups). If there is disagreement, a data coordinator should resolve differences to best represent how the environment is changing in a way that does not count the same event multiple times.

CC5 The *first* instance of implementation of a new program or practice in the community is coded as a community/system change, since it constitutes a change in a program or practice in the community/system.

CC6 A first time occurrence or enactment of a policy is recognized as a community/system change at the point of approval to implement the policy.

CC8 Not all first-time events are community/system changes; *the event must meet all parts of the definition of a community/system change.* For example, if staff members attended a seminar for the first time it is generally not a community/system change.

Examples of Community/System Changes:

- ✓ The Community Health Center established a new program which identifies patients at risk of developing diabetes and provides supports to promote nutrition and physical activity. (A new program. See coding instruction CC1.)

- ✓ The School Board approved a new district policy guaranteeing healthy school lunches. This new policy will increase the number of healthy food options available to students. (A policy change directly related to the initiative's specific objectives. See coding instruction CC1.)

- ✓ The Community Health Coalition partnered with a network of African American churches to present a series of workshops to community members about prevention of diabetes. This was the first time this workshop was presented in the community. This workshop helped educate community leaders. (A new program created by the coalition's partnering with a local resource. See coding instruction CC1.)

- ✓ The Community Health Center now conducts waist circumference measurements in all wellness and diabetes management appointments. This new practice will assure higher quality care for all patients and will support diagnosis and management of diabetes (A practice change. See coding instruction CC1.)

Examples of items <u>not</u> coded as Community/System Changes:

- ✓ The Community Health Center plans to administer a new program in increase awareness of the role of healthy eating and active living in preventing diabetes. This new program will help community members. (Description written in the future tense. It is coded only if it already occurred. See coding instruction CC1.1. This entry would be coded O.)

- ✓ The Community Health Coalition developed a strategic plan to address state and federal legislative issues. This plan will help the coalition implement better strategies for addressing legislative issues. (This would be coded as a Developmental Activity because it reports a change in processes or organization of the initiative that lead to community or systems changes. See coding instruction CC1.3.)

- ✓ The Community Health Coalition administrative assistant reported that the AME church started a new Sunday afternoon support group for managing diabetes. This new program will help reach more people within our community. (As written, the program was not facilitated by the Community Health Coalition. See coding instruction CC1.4. The entry would be coded O.)

<u>Documentation Instructions</u>:

<u>When writing descriptions of Community Changes</u>:

Description Component	**Example**
<u>Who</u> was involved in this change and what are their positions/responsibilities within the community?	*The quality care coordinators at the community health center…*
<u>What</u> new/modified program, policy, or practice was implemented?	*… developed and integrated into the electronic medical records a diabetes management checklist …*
Why? Or to what end?	*to help providers recognize recommended clinic practices, and improve clinical care.*

Community Advocacy Activities (CAs)

General Definition: Activities performed by members of the initiative or group to bring about a new or modified program, policy, or practice in the community, system, or organization related to the initiative or group's goals and objectives. Events categorized as Community Advocacy document the extensive effort it takes to make change in the health system and community.

Community Advocacy activities include acting directly to make changes in the community, actively lobbying, or advocating with targets of change or change agents. Examples include presentations to appointed officials, personal contacts, phone calls, petitions, and letter writing.

Coding Instructions:

CA1 Community Advocacy activities must meet all of the following criteria:

CA1.1 have occurred (not just been planned), and

CA1.2 be related to the initiative's goals and objectives, and

CA1.3 be taken to bring about Community/System Change, and

CA1.4 are facilitated by individuals who are members of the initiative or acting on behalf of the initiative.

CA3 If presentations to community audiences include generating changes to be made in the community (e.g., listening sessions) or are aimed specifically at some change in the community/system (relative to the group's mission), then it is a Community Advocacy activities. If the workshop or other presentation is a service or program to prevent or manage diabetes it is coded as a Service Provided.

CA4 If two or more individuals are documenting a common set of activities and multiple entries describing the same action are being documented: The recorders involved should discuss how to record the action as a single entry (e.g., the same action taken toward the same school official). If there is disagreement, a data coordinator should resolve differences to best represent what actions were taken to change the environment in a way that does not count the same event multiple times.

CA5 Collaboration with community members (people external to the initiative) to set new agendas for the community are Community Advocacy activities.

CA6 Actions taken to keep the group going—working on bylaws, soliciting funding for the group, or holding meetings among members of the group (e.g., committee, coalition)—are not considered to be Community Advocacy activities since they do not contribute directly to changes in the community related to the group's goals and objectives. Internal meetings among group members are generally not considered Community Advocacy activities.

CA6.1. Exceptions occur when members of groups targeted for change are also involved in the initiative and its committees and task forces. For example, at a committee meeting, an intervention for self-management education might be discussed with a representative of the clinic. Since a representative of a community sector to be changed (i.e., the clinic) was involved, it would be considered a Community Advocacy activities.

Examples of Community Advocacy activities**:**

- ✓ Three members of initiative met with the Dr. McCabe to promote her use of a quality care checklist. The Dr. McCabe is considering the request. A follow up conference call is schedule for next week. (Community Advocacy activity because it targets a Community/System practice change. See coding instruction CA1).

- ✓ Members of the initiative asked local pharmacists to display signs promoting consumers having their A1c checked. The advocates wanted to visually display to the community this prompt. (Community Advocacy activity because it is directly related to a Community/System Change relevant to the initiative's mission. See coding instruction CA1).

- ✓ Promise of Health Coalition members called their local legislators advocating for expanded insurance coverage of self-management education and training. (Community Advocacy activity because it is directly related to a Community/System Change relevant to the mission of increasing diabetes self-management. See coding instruction CA1.)

Examples of items <u>not</u> coded as Community Actions:

- ✓ Little Apple Task Force's subcommittee held a meeting to discuss community policies that may be related to self-management education. Little Apple Task Force's main goal is increasing the quality of public education. (This is not a Community Advocacy activity because no one external to the initiative (like policymaker) was present and it was not part of the mission of Little Apple Task Force. See coding instruction CA6. This entry would be coded O.)

- ✓ The Derby Diabetes Prevention Initiative's School Committee held a meeting to discuss the procedures for electing a chairperson. The committee hopes to have the new procedures in place for the upcoming election. (This is not a Community Advocacy activity because it related to change in the committee, not the community/system. See coding instructions CA1 and CA6. This entry would be coded O.)

- ✓ Representatives of the Healthy Promise Community Coalition will contact the Green Valley Neighborhood Association to arrange a meeting to discuss the implementation of a support group. The coalition hopes to have the support group in place within a year. (This item is a future event, not an action that already occurred. See coding instruction CA1.1. This entry would be coded O.)

<u>Documentation Instructions</u>:

<u>When writing descriptions of Community Advocacy activity</u>:

Description Component	**Example**
<u>Who</u> was involved in this action and what are their positions/responsibilities within the community?	*John and Carol from the Healthy Promise Coalition met with Bill Smith, the leader of a local faith community…*
<u>What</u> was the action taken? What community change is it intended to bring about?	*…to advocate for holding self-management support through his faith community.*
Next step(s)?	*Bill will consider their participating and we will call him in one week to answer any additional questions and get his decision.*

Development Activity (DA)

General Definition: Actions taken to prepare or enable the group to address its goals and objectives (e.g., developing quality care tools or materials, developing a community health assessment, working on a strategic plan).

Coding Instructions:

DA1 Development activities must meet all of the following criteria:

DA1.1. are actions taken to prepare or enable the group to do its work (e.g., developing a community assessment, working on a strategic or action plan, designing programs or interventions, developing evaluation instruments, developing plans for sustainability)

DA1.2. have occurred, not just planned

DA1.3. facilitated by members of the initiative or acting on behalf of the initiative

DA1.4 is not (or not yet) a Service Provided, Community Advocacy activity, or Community/System Change

DA2 Development activities include tasks that further the work of the initiative (i.e., assessment, collaborative planning, targeted action or intervention, evaluation, sustainability).

DA3 Development activities can lead to materials or products such as assessments, analyses of information, strategic plans, training manuals, evaluation plans or reports, organizational or sustainability plans, grant applications, or other products related to the work of the initiative.

DA4 Development activities include engagement with the broader community that prepares or enables the group to do its work (i.e., members of the initiative attending a meeting to increase individual skills or capacity to address initiative goals/objectives, or facilitating a meeting with the community aimed at a specific objective(s) like planning a diabetes self-management program at the local housing project).

DA5 Trainings conducted to prepare or build the capacity of staff/ members to implement specific changes in programs, policies, or practices are examples of Development Activities.

Examples of Development Activities:

- ✓ John and Sue from the Coalition implemented the community health assessment. The updated community health assessment will help the coalition better understand the community environment (See scoring instruction DA2).
- ✓ The evaluation work group from the Community Health Coalition worked with evaluators on developing the evaluation plan. This plan will help the Community Health Coalition better understand the effectiveness of their community efforts (See scoring instruction DA2).
- ✓ The Coalition director submitted a grant application for funds for a new program to training promotoras on teaching diabetes self-management procedures. Securing additional funding will help sustain the coalition's efforts in later years (See scoring instruction DA2).
- ✓ The Community Health Center's quality care coordinator worked with staff to develop an action plan. The action plan will be a guide for future changes to clinic practices (See scoring instruction DA1.4).

Examples of items that are <u>not</u> scored as Development Activities:

- ✓ The Director of the Health Care Coalition scheduled a series of monthly meetings with funding agency for ongoing strategy development. (The results of the meetings would eventually be coded as a Development Activity, but not until they actually occurred. See scoring instruction DA1.1 and DA1.2. Entry would be scored as O)
- ✓ School board members met to discuss a review of literature on risk factors related to the problem. (This is not a Development Activity since it was not done by members of the initiative. See scoring instruction DA1.3. Entry would be scored as an O unless school board members are part of the initiative.)
- ✓ The quality care coordinator from the Community Health Center gave a presentation to the network of providers to train about the importance of quality care model. (This is a Service Provided since it involves providing information and communications to community/system members outside the initiative.)

<u>Documentation Instructions</u>:

<u>When writing a description of a Development Activity</u>:

Description Component	**Example**
<u>Who</u> was involved in this product or result?	*Several community health center staff members …*
<u>What</u> is the product or result of planning?	*…developed an evaluation instrument to be administered to patients.*
How will the community or effort benefit from this product?	*…this instrument will help members evaluate patients' perception of services in the clinic.*

Services Provided (SP)

General Definition: The delivery of information, training, material goods, or other activities by members of the initiative to people in the community/system. Services provided include classes, programs, services (e.g., screenings), workshops, material goods, or other services. Records on services provided might include the number of classes or programs conducted and the number of participants in those classes/programs.

Coding Instructions:

SP1 Services provided must meet all of the following criteria:

SP1.1. have occurred and/or are ongoing, and

SP1.2. are information, training, material goods, or other services, and

SP1.3. are sponsored or facilitated by members of the initiative, and

SP1.4. are delivered to the community served by the initiative.

SP2 When a *new* program is initiated (i.e., a community/system change), its first instance of implementation should also be coded as a Service Provided if it meets the criteria for SP. Any continuing instances of programs are coded as Services Provided only.

SP3 If a presentation (e.g., to the clinic director), is intended to bring about a community/system change, then it should be coded as a Community Advocacy activity (CA). If a presentation is intended to deliver information or educate staff about the health goal (e.g., quality care practices), then it should be coded as a SP.

SP4 Each distinct Service Provided (e.g., each new class or workshop) should be entered and coded separately in the ODSS. Subsequent delivery of the service should be totaled for each month and the total number entered into the ODSS.

SP5 Events to plan services (e.g., meetings to decide the content of a class) are coded as Other.

SP6 Media communications that provide information about the initiative's issue and ways to address it are scored as an SP if facilitated/ contributed by the initiative (e.g., media or social marketing campaign facilitated/ contributed by the initiative).

SP7 Efforts to promote availability of services or conduct outreach are examples of SPs.

SP7 Excluded as Services Provided are Dissemination Efforts (DE) and Resources Generated (e.g., a grant or donation to the initiative) that occur internal to the initiative.

Examples of Services Provided:

- ✓ The Community Health Center hosted a class about diabetes management that was provided by the center's bi-lingual certified diabetes educator. (This is a Service Provided since the session provided a service related to the efforts mission. See coding instructions SP1 and SP3.)

- ✓ The Community Health Coalition held diabetes prevention workshops for community members in the regional area. (This is a Service Provided because it is a workshop related to reducing risks for health problems targeted by the initiative. See coding instructions SP1 and SP3.)

- ✓ The Community Health Center and Community Health Coalition co-hosted an outreach screening event at a local church to promote early identification of diabetes. (This is a Service Provided since it is a service related to the goals and objectives of the initiative. See coding instructions SP1 and SP3.)

- ✓ The Community Health Center staff trained local school wellness staff to identify risk factors for diabetes. (This is a Service Provided since it is a training program delivered by the initiative related to the goals and objectives of the group. See coding instructions SP1 and SP3.)

Examples of items <u>not</u> coded as Services Provided:

- ✓ The Community Health Center developed a mailing list of potential workshop attendees. It required several meetings to complete this process. (This is planning for a future service. See coding instruction SP1.1. This item would be coded as O.)
- ✓ The Community Health Coalition has planned diabetes prevention education workshops for the community members. The plan is to reach 1,000 community members. The workshops will be conducted in the month of March. (This service has not yet occurred. See coding instruction SP1.1. This entry would be coded O.)
- ✓ The Quality Care Coordinator presented a proposed change to clinical practices to the executive director and other providers. The director and providers will consider whether to approve this change in practice. (This service was intended to bring about a community change. See coding instruction SP3. This entry would be coded as a CA.)

<u>Documentation Instructions</u>:

<u>When writing descriptions of Services Provided, be sure to include</u>:

Description Component	**Example**
<u>Who</u> was involved in providing this service?	*John and Carol from the Community Health Coalition, and Pastor Roberts from the Ministerial Alliance…*
<u>What</u> information, instruction, or skills development was provided?	*...led an informational session about ways to integrate wellness practices into faith organizations*
<u>Who</u> received the services?	*Participants of the session/workshop were 50 members of the Ministerial Alliance.*

Dissemination Effort (DE)

General Definition: Conveying information about **the initiative and its accomplishments to audiences outside the community to be served.**

Coding Instructions:

DE1 Dissemination effort must meet all of the following criteria:

DE1.1. have occurred (not just planned), and

DE1.2. be an instance of conveying information through presentations, publications, dissemination of policy briefs or other dissemination outlet or other distribution of materials and

DE1.3 efforts are directed at audiences (e.g., other practitioners, researchers) outside the community to be served and

DE2 Dissemination Effort is counted if it features the initiative and its accomplishments.

DE3 Information disseminated through a variety of media such as newsletters newsletter articles, presentation, print media, publications, radio, social media, etc. can be counted as Dissemination Effort.

Examples of Dissemination Effort:

- ✓ A newspaper article described the Health Coalitions recent implementation of its diabetes –self-management training which began this week. Chris Smith from the initiative was interviewed for this article and the initiative was mentioned by name. (See coding instructions DE1.)
- ✓ A presentation on the effects of the mobile self-management prompts on self-management behavior was made at the American Public Health Association annual meeting in Boston. (See coding instructions DE1.)

Examples of items not coded as Dissemination Effort:

- ✓ An article on a substance abuse prevention effort in Washington, DC public schools appeared in the local newspaper. The article featured quotes from the superintendents of five DC schools. (This is not an instance since the program was not connected to the initiative. See coding instructions DE1.3. This entry would be coded O.)
- ✓ The local health department developed and distributed a public service announcement on the importance of getting diabetes screening. (This is not an instance since the press release was sent but the story has not yet been picked up by the media. See coding instruction M1.1. Entry is coded O.)

Documentation Instructions:

Record the instances, type of information, intended audience, mode of delivery, and the amount of information disseminated (i.e., column inches of print media, minutes of broadcast media) for each dissemination effort.

When writing descriptions of Media Coverage:

Description Component	**Example**
What type of media coverage occurred?	*A newspaper article…*
What topic and/or initiative was covered?	*…presented the results of the expanded coverage of diabetes self-management instruction by insurance companies*
How was the initiative involved? (Must be either featured by name OR facilitated by a member of the initiative)	*Carol Jones (member of the initiative) was interviewed for this newspaper article.*

Resources Generated (RG)

General Definition: Acquisition of funding or other resources for the initiative through grants, donations, or gifts in kind. Resources generated can include money, materials, and people's time.

Coding Instructions:

RG1 Resources generated must meet all of the following criteria:

RG1.1. have occurred (not just pending or planned), and

RG1.2. be in the form of money, materials, or people's donated time, and

RG1.3. be used to facilitate activities related to the goals and objectives of the initiative, and

RG1.4. be allocated to the initiative or one of its partners, and

RG1.5. are facilitated by individuals who are members of the initiative or are acting on behalf of the initiative.

RG2 Estimate the value of the donated time by calculating the hourly market value of the services (e.g., professional wage, minimum wage) multiplied by the number of hours of service.

RG3 Estimate the market value of donated materials. For example, if the newspaper donated advertising space for a special event, determine the market value of that advertising space.

RG4 Count grant monies when they are disbursed. For example, if a 5-year, $500,000 grant was awarded and disbursed at $100,000 per year, count one instance of $100,000 every year over the grant period.

RG5 Each separate grant or donation is considered to be a unit of resources generated.

Examples of items coded as Resources Generated:

- ✓ The Community Health Coalition was awarded a $150,000 grant from the Kresge Foundation. These funds will be used to develop and field-test an innovative self-management pilot project workshop. (New grant received. See coding instruction RG1.2)
- ✓ Whole Foods Market donated fruits and vegetables for the initiative's education program. (Donations provided to the initiative for its projects. See coding instruction RG1)
- ✓ The county health department assigned John Thompson, their research associate, to serve as a free consultant for the Community Health Coalition's evaluation effort that is examining program effectiveness. (Staff time was donated. See coding instructions RG1.2 and RG2)
- ✓ A copying machine was donated to the initiative. This machine will be used for administrative tasks associated with the Community Health Coalition's efforts to prevent diabetes. (Donation of materials for the initiative. See coding instruction RG1.2).

Examples of items that are <u>not</u> coded as Resources Generated:

- ✓ The Community Health Center's development director submitted a grant proposal to the State Bureau of Primary Care. This grant will fund the development of a diabetes care management program. (This is not a Resources Generated as the application has not yet resulted in a grant. See coding instructions RG1.1. Entry would be coded O.)
- ✓ A partner received funding for activities not related to the initiative. (Resources Generated must be used to facilitate activities related to the goals and objectives of the initiative. See coding instruction RG1.3.)

Documentation Instructions:

When writing Resources Generated descriptions:

Description Component	Example
What was the resource generated? (the money, material, or donated time)	*A local grocery store donated food to the Community Health Center.*
What will the resource be used for?	*These foods were used to conduct food demonstrations during diabetes self-management classes.*

Not Coded, Other (O)

General Definition: Additional activities that are recorded for which no code or definition has been created.

Activities which the group desires to track but that do not fall under one of the group's existing codes should be coded with an "O."

Coding Instructions:

O1 If an item is coded as an "O," it is not also coded as something else.

Appendix C

Key Informant Context Survey

KU Work Group Data Collection
About the Community

Community Name:

What specific **programs** were implemented within or by the organization or as a result of the organization's advocacy efforts to promote the goals of the Together on Diabetes project?

What specific **policies** were implemented within or by the organization or as a result of the organization's advocacy efforts to promote the goals of the Together on Diabetes project?

What **practices** were implemented within or by the organization or as a result of your organization's advocacy efforts to promote the goals of the Together on Diabetes project?

What **services** were implemented within or by the organization to promote the goals of the Together on Diabetes project?

What **advocacy** efforts were implemented within or by the organization to promote the goals of the Together on Diabetes project?

What **development activities** occurred within the organization to promote the goals of the Together on Diabetes project?

What **dissemination efforts** occurred by the organization to convey information related to the goals of the Together on Diabetes project to audiences outside of the served community(ies)?

Were **resources generated** within or by the organization to promote the goals of the Together on Diabetes project?

Appendix D

Together on Diabetes Retrospective Data Collection KI Instrument

Key Informant Interview: SECTION A: KEYINFORMANT LEVEL DATA

[ENTER INFORMATION FOR QUESTIONS A1-A2; DO NOT ASK RESPONDENT]

A1. DATE OF INTERVIEW. ___/___/___ (MONTH DAY YEAR)

A2. TIME INTERVIEW BEGAN. ___:___ AM / PM

Good (morning/afternoon), thank you very much for taking the time to speak with me today. As part of the Together on Diabetes initiative's comprehensive evaluation, funded by the Bristol-Myers Squibb Foundation, the KU Work Group is working with all grantees – the American Association of Diabetes Educators being one of many grantees- to conduct some evaluation activities to help us understand a little bit about the changes that partners are bringing about in communities and systems as well as the services that have been provided as part of implementation of each grantee's respective projects. We will be talking about efforts within your initiative to promote efforts to promote diabetes prevention and care. Because collecting implementation data is vital to informing the overall evaluation, you were identified by American Association of Diabetes Educators staff to provide valuable information to help us address this issue. The purpose of this phone call today is to describe the activities you have implemented as part of the AADE Together on Diabetes project.

I would now like to ask you to verify your name and contact information in case we have additional questions or would like to clarify any information we discuss today.

A3. What is your full name?
_____

A4. What is your preferred phone number? _____
_____

A5. What is your preferred e-mail address? _____
_____

A6. What is your job title/ work site? (IF NEEDED) _____
_____

Key Informant Interview (Baseline): SECTION B: KEY INFORMANT ORGANIZATION INFORMATION

TIME BEGAN SECTION B ☐☐:☐☐ AM / PM

This interview has two sets of questions. First, I will ask you to list the different community programs, policies, practices, or services that have been implemented in your organization as part of the American Association of Diabetes Educators project, as well as any advocacy, development, dissemination, and resource generating activities that may have occurred. Second, I will ask you some more detailed questions about each identified community program, policy, practice, or service. I would like to also add that although we will ask questions about specific types of activities, we do know that there is some variation across different projects and you may have not engaged in a type of activity and we do not have the expectation that you *should have* engaged in that activity. We are trying to ask about a broad range of activities to make sure we get as clear a picture as possible.

I would like to begin by talking specifically about what **your organization** (insert organization name) has done to implement the. American Association of Diabetes Educators project. *Would you describe some of the activities you have done to implement the project at your site or what you regard as the important accomplishments to date?*

Now, I would like to ask more questions about specific types of activities. We are attempting to document what programs, policies, and services that have been implemented in the community since the beginning of the American Association of Diabetes Educators' Project (approximately June 2011), whether ongoing or discontinued.

FOR **EACH Activity** INDICATED BELOW (IN QUESTIONS Q.B2 – Q.B9), COMPLETE A NEW PROGRAM/POLICY LEVEL MODULE (**SECTION C**).

B1. What specific **programs** were implemented within or by your organization or as a result of your organization's advocacy efforts to promote the goals of the AADE project?

Please consider that a "program" may include changes at the community or the organizational level.

POSSIBLE Prompts:

- Have you delivered any new outreach sessions to promote diabetes screening or other patient recruitment efforts within your community?
- Has your organization implemented modifications to any previously existing programs?

1._____
_____
2._____
_____
3._____
_____
4._____
_____
5._____
_____
6._____
_____

B2. What specific **policies** were implemented within or by your organization or as a result of your organization's advocacy efforts to promote the goals of the AADE project?

Possible Prompts:

- Have policies been implemented within your community(ies) that will improve clinical markers for diabetes, such as a tobacco-free grounds policy, as a result of the work of your organization?

1._____
_____
2._____
_____
3._____
_____
4._____
_____
5._____
_____
6._____
_____

B3. What **practices** were implemented within or by your organization or as a result of your organization's advocacy efforts to promote the goals of the AADE project?

Possible Prompts:

- Has your organization developed new practices or have existing practices that will improve patient quality of care?

1._____
_____
2._____
_____
3._____
_____
4._____
_____
5._____
_____
6._____
_____

B4. What **services** were implemented within or by your organization to promote the goals of the AADE project?

Possible Prompts:

- Has your organization conducted diabetes education sessions among program patients?

1._____
_____
2._____
_____
3._____
_____
4._____
_____
5._____
_____
6._____
_____

B5. What activities were conducted by your organization to **convey information** related to the the goals of the American Association of AADE project to audiences outside of the served community(ies)?

Possible Prompts:

- Have you presented lessons learned from your initiative at a national conference?

1._____
_____
2._____
_____
3._____
_____
4._____
_____
5._____
_____
6._____
_____

B6. What activities were conducted within or by your organization **acquire resources** for the initiative through grants, donations, or gifts into promote the goals of the AADE project?

Possible Prompts:

- Have you received funding or donated resources in-kind to sustain the work of your initiative?

1._____
_____
2._____
_____
3._____
_____
4._____
_____
5._____
_____
6._____
_____

B7. What **actions** were taken to produce a new or modified program or policy, or practice in the community or system within or by your organization to promote the goals of the AADE project?

Possible Prompts:

- Has your organization established any new partnerships or collaborations that will produce new or modified programs, policies, or practices?

1._____
_____
2._____
_____
3._____
_____
4._____
_____
5._____
_____
6._____
_____

THIS FORM REPRESENTS THE **ONE MODULE** THAT SHOULD BE COMPLETED FOR **EACH INDIVIDUAL** ACTIVITY / ACCOMPLISHMENT (AS LISTED IN SECTION B).

NOTE: FOR EACH ACTIVITY/ACCOMPLISHMENT LISTED IN SECTION B, ASK QUESTION C1 FOR EACH FIRST AND THEN RETURN TO COMPLETE THE RELEVANT QUESTIONS IN SECTION C FOR THE RESPECTIVE ACTIVITY. COMPLETE SECTION **C2 FOR COMMUNITY/SYSTEM CHANGE, COMMUNITY ADVOCACY, AND SERVICES PROVIDED**, **C3 FOR COMMUNITY ADVOCACY**, COMPLETE SECTION COMPLETE SECTION **C4 FOR SERVICES PROVIDED**, COMPLETE SECTION **C5 FOR DISSEMINATION EFFORT**, AND COMPLETE SECTION **C6 FOR RESOURCES GENERATED**.

SECTION C

GENERAL (PROGRAM/POLICY) QUESTIONS

C1. I would like to understand the specific details about [state the name of the activity / accomplishment.] Could you please describe the program by telling me **who**, did **what**, **when**, **with whom**, and **toward what goal**.

WHO [Organization/Program Reps/Coalition] implemented or led the activity?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

WHAT did they do? [Ask: What method or approach was used by this program or policy?]

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

WHEN did they do it? [Ask: What was the date of the activity?]

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

WITH WHOM did they do it? [Ask: With whom was this activity performed?]

To what end was this activity directed? [Ask: What was the purpose of this activity?]

Was this the first time this activity has occurred? : ☐ ☐
Yes No

CONTINUE WITH SECTION C QUESTIONS ONLY AFTER QUESTION C1 HAS BEEN ANSWERED FULLY FOR EACH ACTIVITY LISTED IN SECTION B.

NOTE: COMPLETE SECTION C2 FOR **COMMUNITY/SYSTEM CHANGE, COMMUNITY ADVOCACY, AND SERVICES PROVIDED**

Questions re: Goals and Outcomes ask ONLY as needed **GOALS**			
C2.1.	What **goal(s)** were addressed by this activity? Was the goal to….		Improve diabetes self-management..... 1 Improve access/linkage to care ..... 2 Improve quality of health care ..... 3 Increase preventative health behaviors..... 4 Improve clinical health outcomes..... 5 Other ..... 6 N/A ..... -1
C2.2.	What **behavioral outcome(s)** were addressed by this activity?		Adherence to medication regimen ..... 1 Annual health screenings.... 2 Conducting self-blood glucose monitoring..... 3 Conducting daily foot checks ..... 4 Consumption of fruits and vegetables ..... 5 Consumption of sugar-sweetened beverages..... 6 Other ..... 7 N/A ..... -1
C2.3.	What **clinical-health outcome(s)** were addressed by this activity?		A1c levels ..... 1 Blood pressure..... 2 LDL cholesterol..... 3 Triglycerides ..... 4 Healthy weight/BMI..... 5 Other ..... 6 N/A ..... -1
C2.4.	Which **population-health outcome(s)** will be affected or targeted by this activity.		Age-adjusted percent adults with diagnosed diabetes ..... 1 Diabetes-related ED visits and hospitalizations ..... 2 Percent obese ..... 3 Percent of adults consuming less than five daily servings of fruit and vegetables..... 4 Percent of adults not meeting recommended level of vigorous and moderate physical activities..... 5 Percent of adults no leisure-time in past 30 days..... 6 None..... 7 N/A ..... -1

C2.5.	Which behavior change strategies were used by this activity?		Providing information and enhancing skills ..... 1 Enhancing services and support ..... 2 Modifying access, barriers, and opportunities ..... 3 Changing consequences .... 4 Modifying policies and broader systems ..... 5 Other ..... 6 N/A ..... -1
C2.6.	Describe the duration of this activity.		More than once..... 1 One time event ..... 2 Ongoing..... 3
C2.7.	Estimate the number of people in the community who took part in the program (or experienced the policy).		Patients/Consumers..... 1 Allied Health Professionals . 2 Community Members..... 3 Human Service Providers ... 4 Lay Health Workers ..... 5 Others..... 6
C2.8.	Estimate the **percentage** of people in the community who took part in the program (or experienced the policy).		_____ _____
C2.9.	What primary **setting** or **sector** did this activity most affect?		Businesses/Workplaces..... 1 Childcare/Preschool sites.... 2 Criminal Justice ..... 3 Faith-based organizations... 4 Federally Qalified Health Center..... 5 Food retailers..... 6 Health department (local) ... 7 Health department (state) .. 8 Home..... 9 Hospitals..... 10 Other government organizations ..... 11 Media..... 12 Neighborhood ..... 13 Parks and recreation department ..... 14 Primary care offices ..... 15 Schools..... 16 Social service agencies .... 17 Transportation ..... 18 Youth organizations ..... 19 Other 20
C2.10.	In what **zip code** did this activity or accomplishment occur?		_____ _____

C2.11.	At what specific address did this activity or accomplishment occur?.		_____ _____ _____ _____ _____ _____
C2.13.	What were the **targeted groups** whose behavior was to be change by the activity?		Children ..... 1 Parents/Caregivers ..... 2 Community members..... 3 Business people ..... 4 Government elected/appointed officials... 5 Child care providers..... 6 Food and beverage providers ..... 7 Health care providers..... 8 Media..... 9 Patients ..... 10 Parks and recreation personnel..... 11 School personnel ..... 12 Other 13
C2.14.	What were the primary **racial/ethnic** groups actually served by this activity?		White ..... 1 Black/African American..... 2 American Indian/Alaska Native ..... 3 Latino..... 4 Native Hawaiian/Pacific Islander..... 5 Asian ..... 6 Other ..... 7 All 8
C2.15.	FOR KU USE ONLY: Toward what social determinants or contributors to health disparities was the effort directed?		Access to healthcare..... 1 Community power/influence 2 Crime/safety ..... 3 Education ..... 4 Employment..... 5 Housing ..... 6 Poverty/income inequality ... 7 Racism/discrimination..... 8 Social cohesion/connectedness .... 9 Transportation ..... 10 None..... 11 Other 12
C2.16.	FOR KU USE ONLY: At what socio-ecological leve is this activity intended to have the most effect?		Individuals..... 1 Family/Relationships..... 2 Organizations ..... 3 Community ..... 4 Broader system..... 5 All 6
C2.17.	FOR KU USE ONLY: At what geographic level is this activity intended to have the most affect?		Local..... 1 Organization ..... 2 County ..... 3 Regioin ..... 4 State..... 5 All 6

NOTE: COMPLETE SECTION C3 FOR **DISSEMINATION EFFORT**			
C3.1.	**Date** of dissemination effort?		_____ _____
C3.2.	What **type of information** was disseminated?		How-to information ..... 1 Policy brief ..... 2 Program information ..... 3 Research/evaluation information ..... 4 Other 5
C3.3.	What was the **intended audience**?		Appointed/elected officials ..... 1 Health care providers ..... 2 Patients ..... 3 Peers/family ..... 4 Researchers ..... 5 Other 6
C3.4.	What **mode of delivery** was used in the dissemination effort?		Newsletter ..... 1 Presentation ..... 2 Print media ..... 3 Professional publication ..... 4 Newspaper ..... 5 Radio ..... 6 Social media ..... 7 Television ..... 8 Text message ..... 9 Web-based ..... 10 Other 11
C3.5.	**Amount** of information disseminated.		_____ _____
NOTE: COMPLETE SECTION C4 FOR **RESOURCES GENERATED**			
C4.1.	What type of resource is this?		Cash ..... 1 Grant ..... 2 In-kind ..... 3 Volunteer time ..... 4 Other 5
C4.2.	What **organization or individual** provided this resource?		_____ _____
C4.3.	**Amount** of Grant/Cash? (round to the nearest dollar amount)		_____ _____
C4.3.	**Amount** of in-kind resources contributed in dollars? (round to the nearest dollar amount)		_____ _____